

THIS WEEK IN METALWORKING

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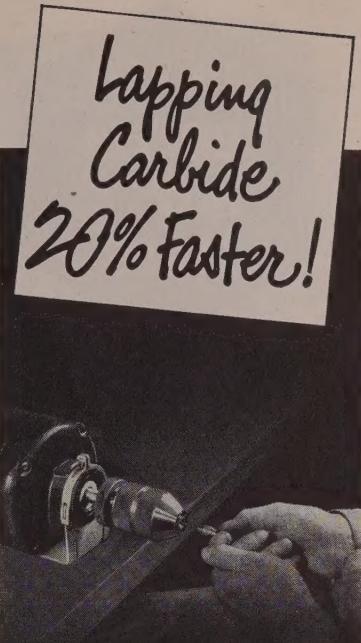
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Next Week . . . The U. S. Motor and Generator Industry . . . Improvements in Powder Metallurgy Techniques . . . Upside-Down Stitcher Saves Critical Steel . . . D.C. Synchros Control Feeds on Huge Boring Mill



Carbide spray nozzle orifices are finished to tolerances of .0005" at Spraying Systems Company, Bellwood, Illinois. New Elgin Dymo-C diamond abrasive used in place of diamond powder-oil mixture produces more pieces per hour and conserves diamond, too!

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Here is a complete new diamond abrasive specially prepared to speed carbide finishing operations. It cuts faster, won't work back on the lap, won't settle and comes ready to use without time-consuming mixing. Write for complete information—ask for a free demonstration.

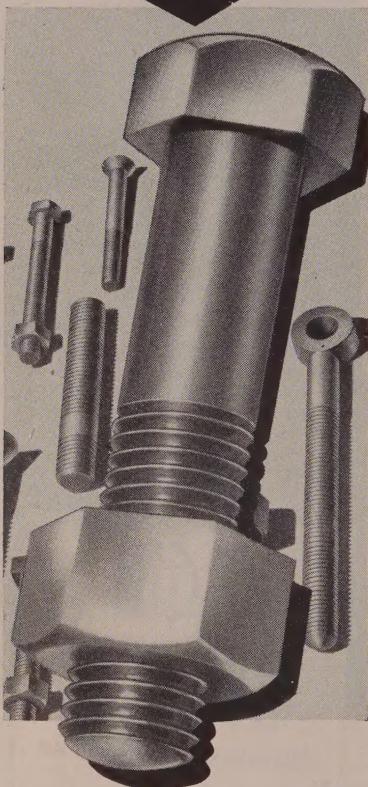
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Behind the Scenes...

New Man

A new name has been added to the masthead. It belongs to Art Zimmerman, new assistant editor who will help bring you in STEEL every Monday even broader coverage of metalworking developments. Art was formerly with World Publishing Co., Cleveland, a firm that specializes in publishing Bibles. He went to Hiram College, Hiram, O., and followed up with graduate work at Western Reserve University in Cleveland.

With Art's arrival, STEEL now has a full-time editorial staff of 28 in the U.S. and nine part time correspondents scattered throughout the country. In addition, we have a London bureau plus correspondents in Canada, Latin America, Europe, South Africa, India and Australia.

Condemned

Socialist planners leave no stone unturned in their search for things to plan. A British magazine, *Individualism*, tells us that the Royal Commission on Capital Punishment spent two years studying all the intricacies of the death sentence, and came up with the fascinating suggestion that radio sets be installed in the death cells on the eve of the execution, "in which case programs would be carefully selected."

Who selects the programs? Not the miserable listener, but one of the planners. We wouldn't want to be in that planner's shoes. Should the condemned man be privileged to listen to the B.B.C.'s program on how to stuff birds, the newscasts or, in a lighter vein, an hour or so of chamber music? We could never make up our mind.

We have moved beyond the helpless delights of "the cradle to the grave" and officials now draw their salaries all the way from pregnancy to the gallows.

More Production

Just a decade ago, in the Sept. 8, 1941, issue, STEEL's Business Trend department carried the information that in the latest period available the steel ingot operating rate was 96.5, the weekly auto output was 40,000 and the weekly electric power output was 3,224 million kwh. In this week's Business Trend, which begins on page 79, all those production indexes are higher, in a period that bears some resemblance to that

ten years ago. The percentage ingot rate is not so much different from that in 1941, but the capacity is far greater. The weekly auto output is about three times the 1941 rate and electric power generation has more than doubled.

The Business Trend is one of the oldest departments in the book. Its current proprietor is Assistant Editor Sam Baker. Every week he puts together figures to give you 26 indicators of the current economic activity. What's more, he writes the text in the section which carries the editorial staff's interpretations of those and other economic indicators.

Misnomer

The Joint Committee on the Economic Report has just finished a study on "Making Ends Meet on Less than \$2000 a Year." The title is a misnomer, for none of the people in the case studies we read in the thing could be considered "making ends meet." All we learned was that you can, in a pinch, substitute lard for butter and get low rent if 14 people live in one room.

We think the government people need some lessons on how to write. By simply changing the title on that study to "How To Be Miserable or \$2000 a Year," the writer would have adequately described what the booklet really is, a study of the abject conditions under which about 10 million families in the U. S. live.

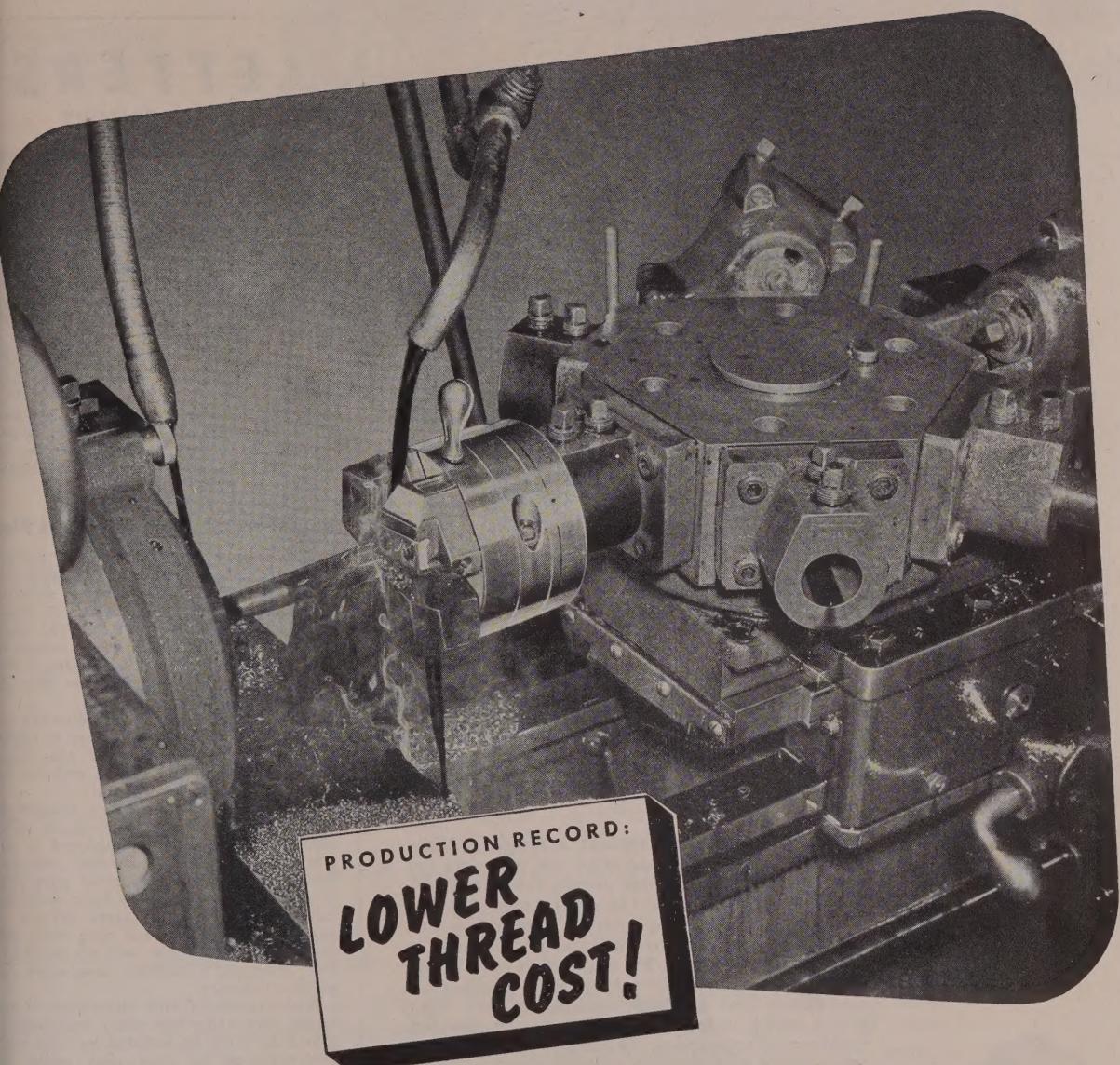
Puzzle Corner

In the Aug. 27 problem, the coal company ended up \$216.70 in the red. Robert W. Huff of Canton, O., was first in with the correct answer.

The time has come for the puzzle we carry every year about this time as the convention season starts and you metalworking people start using the hotels more frequently.

Three men enter a hotel and pay \$30 for a suite. The clerk later discovers the price is \$25 and gives the bell boy \$5 to return to the men. The bell boy cannot divide the \$5 equally among the men so he keeps \$2 and gives each man \$1. The men then had paid \$9 each, or a total of \$27 and the bell boy had \$2. What became of the other \$1?

Shadlu



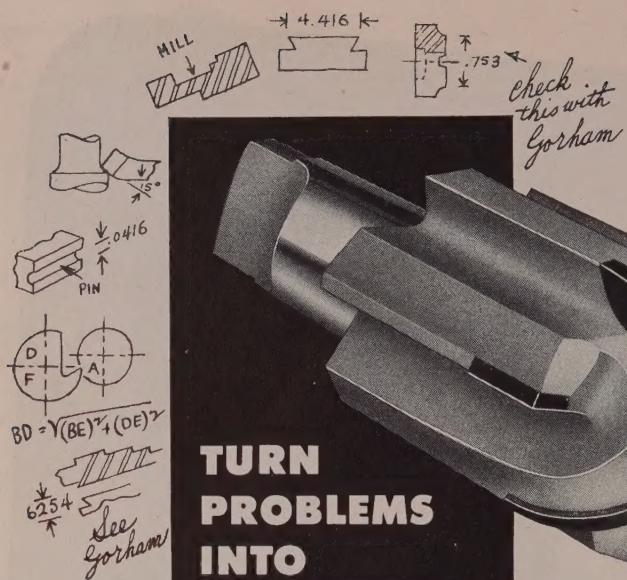
TIME Study and Methods Department records of a large aviation equipment company furnish data of another job where LANDMATIC Heads have effected large savings in machine time and improvements in product quality.

In this operation, the 1 1/4" LANDMATIC Head on a turret lathe equipped with Lead Screw Attachment is cutting a 5/8-6 Acme thread on a Stabilizer Screw used by a light aircraft manufacturer. The thread was held to the close tolerance of $\pm .001$ between the P.D. of the thread and the O.D. of the screw, for a full thread length of 5 3/8" on cold-drawn piston stock, Spec. #AISI, B1112.

The thread is now cut in one pass in .192 minutes with a spindle speed of 230 R.P.M., giving an average of 400 pieces per chaser grind. This is a saving of approximately 75%. Former methods required two passes—one roughing and one finishing cut—and hand fitting with the mating nut was necessary in assembly.

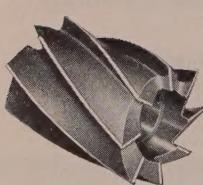
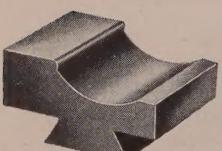
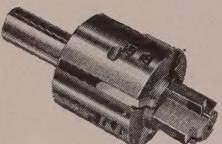
LANDMATIC Heads are stationary threading heads with self-opening action designed primarily for turret lathes. Their unusually-large oversize capacity makes them ideally suited for these machines. For detailed information and specifications, write for illustrated Bulletins F-80 and F-90.

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LETTERS TO THE EDITORS

Report on DC Flashover

We are particularly interested in results from "flash over" on DC motors. Thus, we would like to know how to obtain the Navy Research Laboratory report on which STEEL based its item, "More Power for Motors," (Aug. 27, p. 71)

C. L. Newby, western manager
Hyatt Bearings Division
General Motors Corp.
Chicago 4

• Write to Office of Technical Services, U. S. Department of Commerce, Washington 25. Title of the report is PB 102 598, *Flashing of DC Machines Caused by Short Circuits*.

Engineers: A More Efficient Plan

The supply of engineers and technical personnel available to industry has been inadequate for several months. STEEL's article, "Engineers: A More Efficient Use," (Aug. 20, p. 49) indicates the government is finally aware of this situation . . . and is making a belated attempt to utilize these men to greater advantage.

The stimulation of enrollments in engineering schools is necessary to maintain an adequate supply of new engineers. However, the effects will not be felt for at least three years.

Steps taken to relieve the immediate shortage would have been much more effective had they been initiated at the start of the selective service program. Now, most trained technical personnel of draft age have already been inducted into the Army. Employers' efforts to gain deferment for such men were unsuccessful since there was no provision for deferring essential engineers in private industry.

As a result of this short-sighted attitude, the Army has many engineers in jobs that could be handled by men with less training or jobs that could be eliminated.

I believe steps should be taken to determine whether drafted engineers are more valuable in present capacities than in their former jobs. If not, they could be returned to their positions in defense industry. In addition, engineers now in the Army who were not employed previously in defense industry might be more valuable if they were allowed to take defense jobs now.

In my opinion, a plan of this kind would do much more to satisfy the immediate demand than the program outlined by the Department of Labor.

Pfc. Earl W. Sherburne
9361st TSU, Red River Arsenal
Texarkana, Tex.

• Amen!

Increasing Surface Hardness

Are reprints available for the article by W. J. Rietze, titled "High Speed Quenching Oils Increase Surface Hardness?" (STEEL, June 18, p. 72)

E. A. Hill, production engineer
The Paine Co.
Irvington, N. J.

• Reprints are available and copies have been forwarded.

September 10, 1951

Warehouses Pinched

If you're a small buyer of steel, brace yourself. Under the closed-end Controlled Materials Plan, 23 per cent less steel will be supplied to warehouses in the fourth quarter than the average of their receipts during the first two quarters of the year, predicts American Steel Warehouse Association. That will come about because in the first half of this year distributors have been getting their allocated tonnage—at least 85 per cent of shipments made to them during the first nine months of 1950—plus some "free" steel. The free metal will be gone after Oct. 1. An NPA order giving more steel to warehouses is in the works, but it won't become effective until the first quarter, at least.

Nickel: More Coming

Prospects for nickel are a shade brighter. International Nickel Co. of Canada Ltd., the world's largest producer, will have boosted its capacity 5 per cent in 1951. Falconbridge Nickel Mines Ltd., the other principal Canadian producer, also has increased capacity. A third and new Canadian nickel producer will be operating within the next two or three years, and there will be sizeable production again from Cuba soon. Nickel today is one of the metals in tightest supply and is classed in Group I of NPA's list of metals' availability. Others in that group which lists metals in shortest supply include copper, aluminum, lead, tin, zinc, tungsten, cobalt, molybdenum and columbium.

Double the Price

Europeans are offering to sell aluminum pig in the U.S. at 39 cents a pound, compared with the controlled domestic price of 18 cents. The going foreign aluminum prices are averaging about 35 cents a pound. The situation makes it tough for any new domestic producers to get started. That's why Harvey Machine Co., which hopes to get into production in Montana, may have trouble. It can get a \$46 million DPA loan only if it puts up a \$1 million bond and raises another \$8 million.

Boon to Small Business

The Navy buying program is proving a boon to small business. That service is in charge of all Armed Forces hand tool procurement and in fiscal 1951 bought \$45 million worth, 64 per cent of which went to small business. A good Navy subcontracting possibility is in shipbuilding. Four new vessels will be built and 98 converted in naval shipyards.

The Navy Can Help

Need machine tool, forging or foundry work to complete a defense contract on time? The Navy has some such facilities with open capa-

city for use by distressed armament contractors. If you're interested, inform the contracting officer of the Armed Service that originally issued your contract. The Navy facilities are available for Navy, Army or Air Force jobs.

Renegotiation: Action Coming

Watch for more directives on defense contract renegotiation. There's been a long delay in implementing the Renegotiation Act of 1951 passed last March, but four members of the Renegotiation Board required under the new law have at last been appointed. They are John T. Koehler, assistant secretary of the Navy; Frank L. Roberts, chairman of the Military Renegotiation Policy & Review Board set up under the old law; Lawrence E. Hartwig, chairman of the Contract Appeal Board of GSA; and John H. Joss, attorney for GSA.

Double Penalties

Move carefully in making salary changes in your organization. You'll be subject to double indemnities if you step out of line. The Wage Stabilization Board can penalize you once; the Revenue Department can penalize you the second time, points out Harry H. Rose, a Cleveland CPA and attorney. In salary changes made after Jan. 25, 1951, the Revenue Department must disallow the total amount of over-ceiling salaries paid, not merely the portion that's illegal.

The Farmers Are a Factor

Farmers remain a potentially tremendous market for metalworking equipment. Watch your step in criticizing the farm parity system or any other schemes to increase the farmers' incomes. In a preliminary survey of 203,000 farms in Iowa by the Census Bureau, only 117,000 had water pumps, 51,000 water heaters, 30,000 home freezers, 42,000 milking machines, 59,000 trucks, 13,000 pick-up hay balers.

Straws in the Wind

A new military specification has been set up for hot lacquer as a one-coat finish for shells, bombs, grenades and other ammunition components . . . W. B. Quail, Armco Steel Corp., will succeed Richard F. Sentner, U.S. Steel Co., as director of the NPA Iron & Steel Division. . . . Consolidated Vultee Corp. has won an Air Force contract to develop an atomic-powered aircraft.

Here and There in Industry

Some 55,000 tons of primary copper have been lost from strikes since July 1, a deficit that may mean more troubles for CMP (p. 61) . . . Fourth quarter consumer durable allotments under CMP may have to be changed because of the copper situation (p. 61) . . . Structural steel shortages will delay defense expansions (p. 62) . . . The load is heavy on wire rope makers (p. 63) . . . Man the pumps: that's the cry of pump and compressor manufacturers who need more manpower (p. 64) . . . Electroplaters face a shortage of both materials and new business (p. 65) . . . Welding rod production, a good indicator of the defense output rate, promises to be 50 per cent higher in 1951 than 1950 (p. 72).

SINCE

1931



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FREE CUTTING

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the safer coarse tooth saws
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Keep this in mind about Armco ZINGRIP Steel:

Its special hot-dip zinc coating works more like rubber than metal. It flows and s-t-r-e-t-c-h-e-s in brakes and dies. It takes as severe a draw as the base metal without flaking or peeling.

Compare this with conventional galvanized sheets. When these sheets are drawn or formed severely the coating invariably flakes or peels. This exposes the base metal to early rusting and failure.

Armco ZINGRIP has another important advantage. Actual field tests show that its special zinc coating gives longer protection against rusting in atmospheric service than equal-weight coatings on regular galvanized sheets.

Even if you can't include this Armco Special-Purpose Steel in your present plans, it will pay you to have complete technical and merchandising information for the day when it is more plentiful.

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Congress Muddles Along

Throughout 14 days in June, 1951, the Senate Committee on Expenditures in the Executive Departments conducted hearings on ways and means of improving the organization and operation of Congress. Scores of congressmen, senators, government officials and private citizens spoke freely and earnestly on numerous handicaps which prevent members of Congress from performing their duties efficiently. Conduct of the hearings chairmanned by John L. McClellan of Arkansas was exceptionally competent.

In reading the transcript of these hearings the ordinary taxpayer will be impressed with the frank admission by most of those who testified that Congress is hamstrung by archaic rules and procedures. For instance, Sen. Hubert H. Humphrey (Minnesota) said "There is just no way that we can plan anything. The only business in the United States that does not make any plan at all concerning the proper use of its time is Congress."

Robert Heller, Robert Heller & Associates, testified: "As Congress operates today, it has no center of responsibility. There are no clear lines of authority and accountability. In short, Congress does not have a formal definite operating organization. It lacks management."

Sen. Henry C. Dworshak (Idaho) asked Mr. Heller: "Do you realize to what extent members of Congress are required to entertain constituents who visit the national capitol?" and "Do you realize the difficulty of a congressman or senator delegating that duty to some assistant?" Mr. Heller said he understands—"they are difficult."

Throughout the testimony are dozens of similar references to time-consuming activities. For instance, the House spends the equivalent of a month each session answering roll calls. Much of this time could be saved by installing an electric roll-call system, as 26 state legislatures have done. It was pointed out that it took the Senate two weeks and 500 pages of "The Congressional Record" to repeal the tax on oleomargarine.

Fortunately some members of Congress seem to be awake to the urgent need for modernizing congressional regulations and procedures. A few bills have been introduced to remedy certain glaring faults. But this is not enough. The public should show more interest in these important reforms.

E. L. Shaner

EDITOR-IN-CHIEF

WHAT GOES ON HERE? Through no fault of ours, two items in this issue from independent sources virtually swear at each other. In the news section is a report on the

success of the "productivity team" idea inaugurated by Economic Co-operation Administration in March, 1949. In the 29 months since that date 4900 Europeans have visited American

plants on 625 projects. Between now and next June 30, about 500 more visitors are due to study our methods. Apparently the visitations are beneficial. ECA cites cases in England, France, Belgium and Holland where production has increased up to 50 per cent due to the application of ideas originating from these visitations.

The other item pertains to European-built lathes, shapers and milling machines offered for sale in the United States. Prices are 20 per cent lower than those for equivalent American machines, immediate delivery is promised from New York stocks, no priority is required and—the European companies offering these machines were assisted by ECA funds. What goes on here?

—pp. 63, 71, 89

* * *

MOSSBACK INHIBITIONS: A sales engineer temporarily serving in a defense agency in Washington says: "I have learned why government does business the way it does. I used to think the government was manned by men who did not understand business. Since working with these men I have found them to be just about the types you find in private industry. . . . But they have to work in accordance with specific laws, executive orders and regulations that rob them of the flexibility of the man in industry who, to meet a special situation, merely has to get a decision from his boss."

Unconsciously, the sales engineer spots a dreadful curse of Washington. What he terms "specific laws, executive orders and regulations" are out-moded pre-Civil War procedures. Washington pursues horse and buggy routine in a jet-propulsion age.

—p. 68

* * *

GUNS AND BUTTER TOO: According to "Ward's Automotive Reports," early this week the four-millionth automobile built in 1951 will roll off one of motordom's assembly lines. From present indications it looks as if output in the third quarter will hit about 1,161,000 cars. If allocations for the fourth quarter had not been changed, automobile production this year probably would have been higher than in any other year in the industry's history, except for record-breaking 1950.

Even with the additional restrictions on the use of steel, copper and aluminum announced by NPA to go into effect Oct. 1, automobile output

in 1951 will rank with that of the industry's best years. In fact, we have been building up a capacity for balanced industrial production so tremendous that few of us realize its potential. In many respects, we have taken on the defense burden while making only moderate concessions to "business as usual."

—p. 79

* * *

ELECTRODE YARDSTICK: Slightly more than a score of companies comprising the welding rod industry expect to ship over 600 million pounds of their important product in 1951. This is 50 per cent over last year's output but far short of peak annual production of a billion pounds in the hectic war year of 1943.

Welding rod manufacturers are toying with fascinating yardsticks which measure their market in terms of steel output. One is number of pounds of electrode per ton of steel ingot output. Since 1936 this ratio has varied between a low of 2 and a high of 12.2 pounds. Today the figure is 7 pounds. Perhaps a more realistic formula is pounds of electrode per ton of plates, shapes and sheets rolled annually. On this score, the ratio since 1936 has fluctuated between 8 and 47 pounds. In 1950, some 16 pounds of electrodes were used for every ton of plates, shapes and sheets rolled.

—p. 72

* * *

SIX SCORE AND FIVE: Throughout the entire metalworking industry there are only a few score companies which can boast of continuous operations for more than a century. In the machine tool industry, three firms have celebrated centennials. These records emphasize the special significance of the open house being held this week by Heald Machine Co. in Worcester, Mass., to commemorate the 125th anniversary of its founding.

Stephen Heald started a modest woodworking shop in Barre, Mass., in 1826. In due course a blacksmith shop and gray iron foundry were added and the company shifted from woodworking to metalworking machines. In 1903 operations were transferred to Worcester, Mass. Today Heald occupies 350,000 square feet of floor space and employs 1500 persons. Four generations of Heald have conducted the business successfully without a break. This is an unusual record. Congratulations for a unique achievement!

—p. 100

Copper: New Stopper in CMP?

Some 55,000 tons in production of the primary metal have been lost because of strikes since July 1. Shortage will hit consumer durables

LOST: 55,000 tons of primary copper production from July 1 to now because of labor walkouts.

That estimated deficit in U. S. crude primary output may be enough to throw the Controlled Materials Plan for a further loss. Up to now, distribution of copper—and aluminum—has gone forward relatively smoothly under CMP compared with steel. Copper now promises to be as serious a distribution problem as steel, all because complete labor peace in the copper industry has been virtually nonexistent ever since July 1.

Far-Reaching — The effects of strikes are even more serious than the figure of 55,000 tons indicates because some plants tied up accounted for U. S. crude secondary production or for refined output from imported crude copper. One big loss resulted from intermittent walkouts that began July 2 at American Smelting & Refining Co.'s Garfield, Utah, smelter, the biggest in the U. S. A nationwide strike in the industry ran from Aug. 27 through Aug. 31. Kennecott Copper Corp. made peace by Sept. 1. Although a court order late last week put a stop to the rest of the walkouts, full-scale production is only now resuming.

The copper lost through strikes is gone forever. The worst hardship cases were relieved by borrowing from the Munition Board's copper stockpiles, but all that material must be returned from future production. Public information on stockpile figures is not available, but the copper tonnage is guessed as being 500,000. Domestic production can't be increased much from the pace in the first half before strikes brought chaos. A little more domestic output could be squeezed out eventually, but not in the short term. There's little hope of increased imports.

Promising — U. S. crude primary copper output in the first half of 1951 hit 498,138 tons, the best half-year performance since the World War II period. The second half production won't touch the first six-months' rate and total 1951 output will do well to match the 1950 performance of 940,249 tons.

Refined copper imports amounted



than 850,000 tons, compared to about 950,000 tons in 1950.

So, not enough copper will be available for some time. And CMP, which now controls 100 per cent of the production, will have to cut somewhere. The cutting is bound to come in consumer durable goods. The automotive industry is the largest consumer of the metal; about 50 pounds go into every car and up to 400 pounds in every truck. Appliances are another big user. They'll all get the ax.

Consumer Durables Get the Nod

The allotments of copper, steel and aluminum announced Sept. 5 for consumer durables in the fourth quarter don't reveal any unexpected slashes, but NPA says the schedule was worked out before the extent of the copper strike could be realized and drastic changes may be necessary.

NPA is already preparing a flexible "preference" list of uses to which copper will be diverted at the expense of other scheduled uses if the supply proves inadequate to meet the fourth quarter allotment.

The ABCs—The amount of controlled materials made available for production of consumer durable goods in the fourth quarter are: 984,793 tons of steel products, including 950,-308 tons of carbon steel, 24,400 tons of alloy and 10,085 tons of stainless; 53.9 million pounds of copper products, including 42,550,000 pounds of brass mill products, 8.9 million pounds of wire mill products and 2,450,000 pounds of foundry products; 59,000 pounds of aluminum.

Subject to any changes dictated by the copper situation, those metals will go for consumer durables broken down into two classes: Class I includes the most essential consumer durables such as electric light bulbs, safes and vaults, shelving and lockers, food products machinery and similar products; class II includes 50 or 60 less essential classifications such as domestic appliances, paper clips and pipe organs etc. Allotments to the first group were made as close as possible to 100 per cent of the base period. Allocations to group two are more severely cut.

Curtailed—Group two, on the average, will get in the fourth quarter only 58 per cent of the carbon steel it received in its base period (the first half of 1950 or the last half of 1949), compared with an average permitted usage during the third quarter of 70 per cent of the base period. Even less stainless and other

types of steel will be doled out. The copper allotment is based on an average of 54 per cent of the base period; about 46 per cent for aluminum.

Consumer durable goods makers can purchase "free area" material for October production because suppliers can't work in much of the consumer durable needs in time to deliver for October. But those October purchases

will be charged against the manufacturers' fourth quarter allocations. Yet another consumer durables modification—this one still in the works—would permit manufacturers more latitude to use their allotted materials to meet changing consumers' needs.

The amounts of the controlled materials made available for consumer durable goods production are:

	Steel (tons)	Copper (lbs)	Aluminum (lbs)
Mops & dusters	1,379	39,620	104,256
Canvas products	5,000	...	290,000
Frames for mirrors and pictures	600	130,272	17,400
Wood household furniture, non-upholstered	2,000	1,510	1,900
Wood household furniture, upholstered	10,900	...	...
Reed and Rattan furniture	120	...	...
Metal Household furniture	42,942	106,600	1,302,000
Mattresses & bedsprings	23,068	5,000	30,500
Wood office furniture	635	3,000	...
Metal office furniture	45,123	100,520	1,411,000
Public building furniture	16,529	61,334	555,000
Professional furniture	20,875	440,300	818,700
Metal partitions, shelving & lockers	48,413	56,100	300,000
Cases, cabinets, counters & other fixtures	6,777	47,316	475,000
Venetian blinds	35,500	130,272	3,637,517
Restaurant furniture	3,335	20,200	167,000
Furniture & fixtures, NEC	120	1,000	...
Flat glass, except plate & sheet	190	11,945	64,327
Tinware (except cans, cooking & kitchen utensils)	7,386	...	174,000
Cutlery	2,283	161,270	11,600
Razors & blades	1,223	334,485	...
Vacuum bottles & jugs	1,669	31,447	474,545
Casket hardware	2,859	28,935	4,400
Domestic heating stoves & space heaters	22,178	230,388	157,288
Domestic cooking stoves, ranges & appliances except electric	58,337	662,805	558,909
Commercial cooking & food warming equipment, except electric	7,367	486,000	650,000
Enamelled cooking & kitchen utensils	8,436	...	8,964
Enamelled products, NEC	16,655	...	...
Incandescent & fluorescent portable lamps & shades	2,706	728,800	203,400
Incandescent hand portable lighting equipment	646	1,366,600	76,000
Nonelectric lighting equipment	670	298,647	31,636
Wire Products NEC	11,600	2,224	17,400
Safes, chests & bank vaults	8,907	301,900	45,300
Lawn mowers	12,760	87,475	1,000,000
Commercial dishwashers	1,351	460,000	50,000
Food products machinery	2,087	300,000	750,000
Household washing machines	38,175	1,566,000	4,695,000
Household laundry equipment, NEC	11,734	181,700	265,000
Sewing machines	1,896	62,400	451,600
Vacuum cleaners, household	4,073	817,200	2,296,000
Household refrigerators	122,171	6,397,000	7,034,000
Home & farm freezers	19,162	703,000	554,000
Floor waxes & polishers	86	23,400	54,500
Electric fans, except industrial type	5,740	695,000	614,000
Small household electric appliances, except fans	11,292	2,305,000	4,372,000
Household ranges, electric	36,313	872,199	1,271,782
Commercial cooking & food warming equipment	2,820	240,000	336,000
Electric lamps—bulbs	3	17,000	14,000
Primary batteries, dry	1,900	623,000	...
Lamp components	312	3,008,000	750,000
Electrical products, NEC	106	480,000	72,000
Motorcycles, bicycles & parts	19,148	260,346	372,000
Silverware & plated ware	1,660	3,492,800	696,000
Pianos	525	256,840	141,000
Organs	412	142,640	41,000
Piano & organs parts & materials	600	15,428	2,000
Musical instruments & parts	65	376,280	20,000
Games & toys	35,026	352,960	490,000
Dolls & stuffed toy animals	400	...	...
Baby carriages, etc	5,100	2,000	150,000
Sporting & athletic goods	16,997	1,122,330	850,000
Pens, mechanical pencils & pen points	1,862	1,534,000	276,000
Lead pencils	365	236,944	...
Marking devices	3	780,000	250,000
Costume jewelry, findings & cases	3,304,000	100,000	...
Metal buttons & parts, civilian type	718	173,333	43,300
Brooms & brushes	1,135	125,383	77,744
Morticians' goods	10,950	326,960	19,800
Signs & advertising displays	18,700	488,064	250,000
Umbrella frames & canes	4,500	...	100,000
Hospital enameled ware	1,200	...	...
Soda fountain equipment	452	120,815	18,718
Cooking & kitchen utensils (except enamel)	9,602	490,081	13,841,000
Galvanized ware	21,513	...	...
Drapery hardware	3,625	113,610	24,650
Fireplace equipment	1,740	773,612	1,450
Carpet sweepers	691	1,000	4,218
Spring wire	23,300	...	...
Etched products	1,208	640,000	466,000
License plates	6,000	...	60,000
Porcelain electric products	14,614	250,000	750,000
Metal fastening devices	7,528	7,770,532	764,400
Glassware	71	5,000	95,000
Church goods	406	185,814	42,182
Office supplies	8,227	...	...
Highway signs	1,264	32,501	152,182
Electric razors	145	56,534	...
Smoking accessories . . . . .	...	...	200,000
Mirrors	334	12,364	...
Corset steels	334	3,000	...
Squeegees, etc	18	51,920	...

NOTE: NEC after certain product groups means Not Elsewhere Classified.

Appliance Output Going Down

Westinghouse Electric Corporation's unit production of large and small electrical appliances will be 40 per cent less next month than in September, 1950.

J. H. Ashbaugh, vice president in charge of the electric appliance division, said the cutback was made necessary by National Production Authority restrictions on the use of essential materials for civilian products.

Slash in Structural

Only direct military and aluminum expansion orders will be filled in the fourth quarter

HALF the steel expansion program and three fourths of the general industrial expansions will be delayed due to scarcities of structural steel.

Only direct military expansions and the aluminum program will get all the structural they need. General commercial construction will be cut back to 11 per cent of that projected.

That is the construction picture following fourth-quarter allotments of structural steel by the Defense Production Administration.

Too Little—Demand for structural for the fourth quarter is 223 per cent of what DPA figures will be available. When defense production officials faced up to the task of dividing the available supplies, they allotted 100 per cent to direct military requirements and to the aluminum expansion program. All other demands were scaled down sharply.

The result is that the steel expansion programs will receive only 51 per cent of needs, general industrial expansion programs will get 26 per cent, and commercial construction will receive 11 per cent of needs for the fourth quarter.

The Pie Is Cut—Criteria used in making the allotments was in this order of preference:

1. Facilities under construction to make products urgently needed for Defense and the Atomic Energy Commission.

2. Blast furnaces scheduled to be completed before or in 1952.

3. Steel producing and finishing facilities to be completed this year.

4. Steel producing of finishing facilities owned by small concerns scheduled for completion before mid-1952.

5. Other steel facilities scheduled for completion by mid-1951.

6. Selection of facilities in order of greatest production per ton of structural steel required.

Only Deferred—DPA Chief Manly Fleischmann says that the projects

which will not get structural steel for fourth quarter are not being denied—only deferred. They may get the required steel in the first quarter of 1952.

Following table shows the amounts of structural requested, allotted, and percentages of requests allotted, in net tons:

	Stated Requirements	Allotment	P.C.
Direct Military			
Army	4,059	4,059	100
Navy	7,306	7,306	100
Air Force	31,273	31,273	100
Metals Exp.			
Aluminum	19,010	19,010	100
Iron, Steel	174,957	89,468	51
Ferroalloys	15,514	12,719	82
Refractories	8,736	6,578	75
Foundries	3,883	2,815	72
Other Industrial Exp.	121,723	32,515	26
Commercial Constr.	106,574	12,055	11

Steel Expansion Third Finished

More than one-third of proposed construction for the expansion of iron and steel facilities is expected to be completed by Oct. 1, says NPA.

NPA bases its report on figures submitted by 67 iron and steel companies which have certificates of necessity for rapid tax amortization. The figure shows that of nearly \$2 billion in added facilities planned through 1953, more than \$618 million worth of construction will be in place by the end of this month.

At the end of the first quarter of this year, \$378 million worth of construction was complete, the study shows. By the end of the second



SKY'S THE LIMIT: Urgent demand for machine tool delivery was emphasized by Reid Brothers Co. Inc., Beverly, Mass., when it shipped a production lathe to Cleveland. The 2 1/2-ton 9-inch machine tool, weighing 6000 pounds, was loaded aboard a plane, flown to Cleveland, unloaded and trucked to Warren, O., where it will be used by Mullins Mfg. Corp. for operations in manufacturing shells

quarter that figure rose to \$419 million.

The agency says that the aluminum expansion program, which started later than the steel program, is moving well but emphasis so far has been on steel. Of a total \$501 million proposed for the aluminum expansion program by the end of 1953, more than \$72 million worth of construction is in place.

been placed with British Industries Corp. for delivery within the next two years. Already arriving in this country are some machines needed for arms work, including lathes, millers, radial drills, automatic screw machines and shapers.

The British are having allocations and delivery problems though.

Irwin Lubalin, Machinery Division head of British Industries Corp. is back in England on his third trip this year expediting orders from American manufacturers.

Prices of British machine tools landed here, including duty, freight and servicing, are comparable to prices of American machinery.

Machine Tools from Europe May Ease Shortages Here

THAT LONG waiting list on tool-builders' order books is causing many metalworking companies to take a second look at foreign-built machine tools. They have to fill gaps in their production lines and can't wait two years for deliveries of domestic units.

At least two teams of experts representing large American firms have appeared at the European Machine Tool Exposition that was held in Paris Sept. 1-10. These groups have been given free reign to buy turret lathes, engine lathes, milling machines, grinders and various other hard-to-get equipment—if quality proves in any way comparable to equivalent American machines and if repair parts service can be assured. Some 60 English, French, German and other European companies displayed their products at the Paris show ending today.

Here, Too—In the meantime traveling exhibits of European machines are being staged in American industrial centers. One held in Cleveland last week included a high speed geared head lathe built in the U. S.

zone of Germany, a Danish universal milling machine and a crank shaper built in The Netherlands. The lathe was designed by Germany's Dr. Schlessinger, well-known in American machine tool circles.

Machines on display appeared to be quality units, though they lacked the fine finish of domestic models. Marked American influence was noted in their design. Relatively low prices quoted are attributed by importers to low labor rates abroad. American observers are more inclined to credit Marshall Plan aid for this situation.

Balance of Trade—German lathes are said to be coming into the U. S. at a rate of about 30 a month. This represents a major output slice of the Frankfort plant where they are made. Their importer claims there has been a sensational revival of machine tool building in Western Germany.

British Line Up Tool Orders

Orders for more than \$9 million worth of British machine tools have

Heavy Load on Wire Rope

You can get deliveries on some sizes quickly but popular types take up to eight months

HEAVY LOADS are being borne on wire rope these days. The industry that produces wire rope is swinging a heavy load too—and with consummate ease.

Manufacture of stranded and braided rope, cable and slings occupies about 50 metalworking companies. A handful of these turn out the bulk of total output, though. They are the large integrated companies with wiremaking facilities. Handling equipment such as hoists and cranes uses a lot of wire rope; other applications include bridge and highway guard cable and control equipment.

Magic Touch—Expectations of 30 to 50 per cent better business in '51

are common in the industry. Strangely enough, demand today is just about on a par with that of a year ago—but demand at this time last year was tremendous too. Buying gained momentum soon after the outbreak in Korea and rolled to a peak in the fourth quarter of 1950 and first quarter of 1951. But makers of wire rope aren't too much concerned about orders tapering off slightly: They have enough to do already to keep them busy for the rest of the year.

You can get delivery on some sizes of wire rope within a month, others little before seven or eight months. Backlog of all sizes averages about four months. Shipment promises on sizes from $\frac{1}{2}$ to $\frac{7}{8}$ -inch are tough to get. That is the most popular size range, even in wartime.

Where It Goes—Users of wire rope are well diversified, but construction, oil field and mining operators are the more active consumers. General operating and maintenance requirements of steel and manufacturing industries take a good share of production. Shipping customarily uses a lot, but demand is nowhere near its wartime rate. Elevator requirements are off somewhat because of restrictions on commercial building.

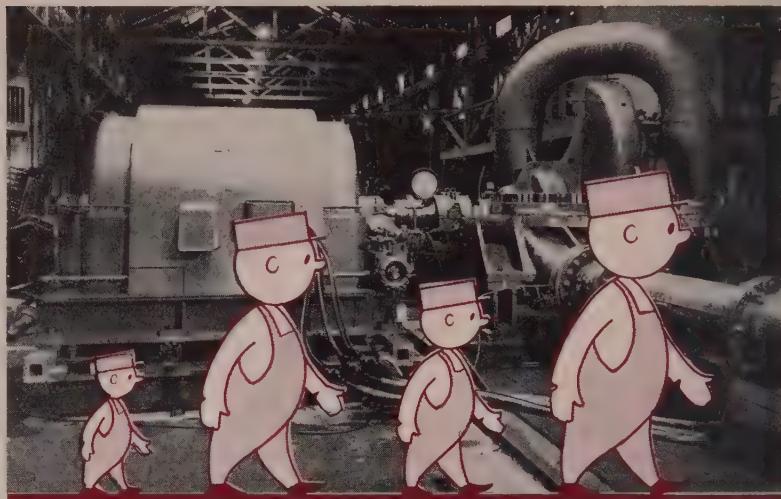
Direct military buying has increased most percentagewise over the past year, but doesn't even approach the amount taken during the war. Large producers of wire rope have as little as 10 per cent of capacity going directly to the military. Smaller companies—many of them war-born outfits not yet developed to a national scale—have been more active in driving for defense work to sustain operations. Average for all producers is close to 30 per cent. The army today is buying more wire rope than the navy; the opposite was true during the war.

On the Chin—Small producers are having a much tougher time lining up materials. That's because they're the non-integrated outfits and must buy their wire on the outside. Priced under the general freeze order, wire rope today bears the same price tag it did last December.

Heat's Off Transformers

Electric transformers one third lighter than present models may result from experiments at Westinghouse Electric Corp.'s transformer division. There a new jet spray cooling technique that dissipates heat ten times faster than present processes has been developed. First experimental unit incorporating the vaporization cooling system delivered some 350 per cent more power than normal capacity.

Production Workers in Pumps and Compressors Industry



1939	1947	1949	1951
20,063	40,358	30,888	45,000

Needed: Pump Labor

Pump, compressor industry is employing a postwar high of 45,000, but wants more

MAN THE PUMPS!

That's the cry at many of the 350 plants in the United States primarily devoted to the manufacture of pumps, compressors and related equipment. Some are having trouble getting enough manpower—especially skilled—to keep up production. That's despite the fact that estimated employment of factory workers in the industry is at a postwar high of about 45,000 (see the chart).

The Ubiquitous Pump—More labor is needed because the industry's 1951 dollar volume is running 15 to 20 per cent above that of 1950. Continued high output is necessary because the industry's products constitute one of the most frequently used classes of machinery in the world today. At least one pump or compressor is an integral piece of equipment in thousands of metalworking plants; several are in every automobile; gas and oil transmission lines require a lot of pumping equipment, as do public utilities, chemical, processing and mining industries.

The industry is producing heavily for defense although individual company experiences vary as widely as do the types of pumps and compressors made. Some firms find that as little as 10 per cent of their output is going for defense; with others as much as 80 per cent is military bound. The average is 25 to 30 per cent. Major defense users of pumps are the

Atomic Energy Commission, aircraft manufacturers, the Navy for marine applications and Army Ordnance for gun mounts and general tank and automotive uses. The problem of conversion in the industry is not serious because most pumps and compressors for defense are similar to the civilian requirements.

Pressure Up—Sales of all pumps except the turbine classification were at the rate of \$6.8 million a month in the first quarter. That's well above the 1950 monthly average of \$4.5 million. Monthly sales of compressors in the first quarter averaged \$5.9 million for a classification including stationary compressors of a wide variety, complete portables and rock drilling equipment. The monthly average for that compressor classification in 1950 was \$2.7 million. Bureau of the Census figures reveal that all pump and compressor shipments in 1949 were valued at \$490.2 million; \$552.5 million in 1947 and \$141.8 million in 1939. Total current sales figures are unobtainable because of the diversity of the industry's production and because 250 plants, in addition to the 350 that produce pumps and compressors as their major activity, turn out the products as a minor activity in conjunction with other items that account for their major operations.

The industry has materials problems, as does everyone else, but its difficulties are not seriously curtailing production. Delivery on some of the big items, such as steam turbines may take three years, but shipments can be had within two or three weeks on the small standard pumps and compressors.

Double Trouble in Plating

Electroplaters face shortages in materials and business. Job shops hardest hit

ELECTROPLATERS face two shortages—in materials and business.

The scarcity of new orders somewhat compensates for the scarcity of chromium, nickel, copper, tin, zinc, cadmium and brass, but that's the kind of compensation which is not welcomed. Job platers are operating at only about 50 per cent of capacity. Captive shops are doing a little better, partly because they have a relatively easier time getting scarce plating materials.

Repeat Performance—The industry wrestled with much the same situation in World War II. Then, the vague knowledge in government circles about plating caused undue suffering among established platers when the government allowed manufacturers to put in their own facilities, thus leaving the job shops out in the cold. Some 4000 job shops—about 2500 of which have more than 20 employees—will probably have sales totaling an estimated \$15 million this year. That's only about 15 per cent of the total electroplating volume, and the jobbers don't want the proportion going to the captive shops to increase.

Electroplating business is off because of the curtailments on production of civilian goods, especially automobiles, and because defense applications for electroplating are not extensive. Only about 10 per cent of the average job shop's volume is now

going for defense. Electroplaters, particularly the independents, are mapping a two-way program to lift themselves by their own bootstraps. They're seeking more defense applications for plating or the electrodeposition process. They're seeking to find out more about their industry, so future problems can be better met.

Fact Finder—National Association of Metal Finishers, a trade group that represents much of the industry, is doing the fact finding job on a commission from the government. It will find out how big the industry is, what equipment it has, where excess capacity is available. That will enable it to act as a clearing house for prime contracts seeking plating facilities and will help solve the duplicate facilities problem of World War II.

A tough problem is to find new defense applications. Most armament jobs now are for aircraft parts, shell and fuse components, firing pins and a wide range of ordnance items. Many job shops can go into the hard chrome field while the emergency lasts. Hard chrome plating is adapted for such products as gages. Platers' facilities may also be mobilized by greater use of the electrodeposition process for producing parts. That method is used currently to manufacture tire molds.

Platers, particularly the job shops, have one consolation: Shortages in new orders and materials mean that they don't have a scarcity of labor.

Harrisburg Steel Expands

Harrisburg Steel Corp., Harrisburg, Pa., acquired the plant and business

of the Boiardi Steel Corp., Milton, Pa. The action is expected to give the Harrisburg Steel Corp. a one-third immediate increase in output.

Obligations of the Boiardi Steel Corp. totaling \$800,000 were retired and \$19,500 in Harrisburg Steel stock was issued in the transaction.

Ferroalloy Plant Fired Up

Electro Metallurgical Co.'s new ferroalloy plant in Marietta, O., started production last week as first of a score of electric furnaces was put in operation.

First products of the new plant will be alloys of silicon, manganese and chromium, the latter including a new product for making stainless steel.

Two 40,000-kilowatt turbine and generator units have been installed. Two more will be in operation by early 1953, raising capacity of the power plant to 160,000 kilowatts. Work at the company's 800-acre site on the Ohio river was started early in 1949. The plant—one of the largest of its type in the world—represents a major share of the company's \$135 million expansion program.

Carpenter Acquires Wire Works

Carpenter Steel Co., Reading, Pa., has acquired the assets of the Webb Wire Works Co., New Brunswick, N. J. The transaction becomes effective July 2, which was the beginning of Carpenter's fiscal year. The Webb plant comprises about 5000 square feet and has an operation of around \$500,000 a year.

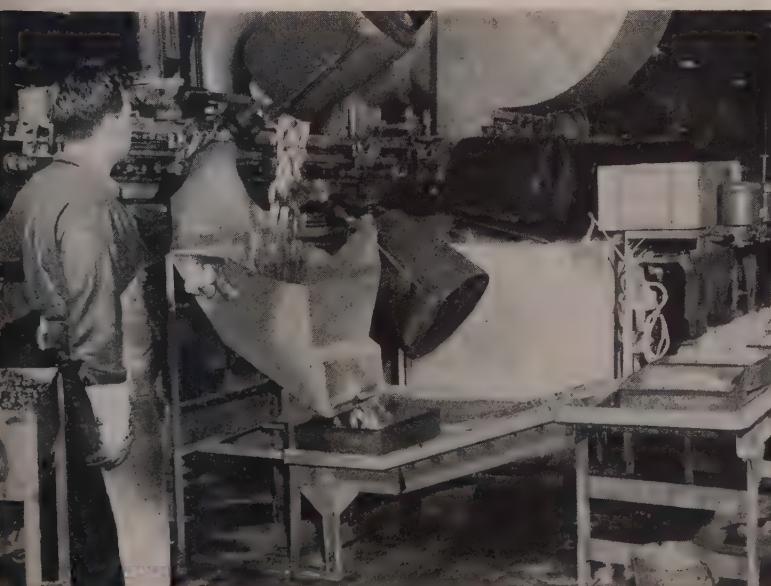
Carpenter Steel exchanged 11,450 shares of its common stock for the wire works, which will be operated as the Webb Division of Carpenter. Everett Waltman, of the Carpenter organization in Reading, will be manager of the division. E. H. Webb, president of the Webb Wire Works, will serve as management consultant for a brief period.

Jess Larson's Job

It's going to be a big one getting DMPA to take over work of GSA, ECA, DMA, etc.

IN HIS NEW JOB as head of the Defense Materials Procurement Agency (DMPA), Jess Larson has the sole responsibility for procurement of 62-odd critical and strategic materials. And he's drawing the blueprint for the new agency slowly and methodically. He has to. Many other agencies will be affected by DMPA.

Mr. Larson's job is to get all the



ELECTROPLATING: \$15 MILLION BUSINESS FOR JOB SHOPS THIS YEAR
... and they will operate at only 50 per cent of capacity

materials he can for the national stockpile and for resale to defense contractors and essential civilian industries.

He is planning to buy from foreign and domestic sources and he'll direct expansion programs wherever it is necessary to get more of the critical materials.

Encompassing—The job is a big one and it stacks up like this: DMPA must take over all minerals and metals procurement from the General Services Administration, the Defense Minerals Administration, the Economic Cooperation Administration and a number of others. He is going to recruit his help from trained personnel of the aforementioned agencies. He himself will continue to head up GSA.

DMA will be pretty well wrecked in the reorganization—perhaps even completely liquidated—and its remaining activities turned over to the Bureau of Mines. It is possible, too, that it will be confined to carrying out just certain domestic mineral expansion programs. New acting administrator of DMA is Dr. Wilburn C. Schroeder, previously chief of the Bureau of Mines Synthetic Liquid Fuels Branch. Dr. Schroeder succeeded Dr. James Boyd (director of the Bureau of Mines) as DMA head. That all came about after a policy dispute between Dr. Boyd and Interior Secretary Chapman. Interior officials wanted to start work on a \$400 million commercial size plant for producing liquid fuel from coal. Dr. Boyd didn't think research had gone far enough to warrant a commercial plant. Result: Dr. Boyd left DMA.

GSA Goes Shopping

Added to the General Services Administration's market list is domestic chrome ore and chrome concentrates—200,000 tons worth.

The chrome ore and concentrates must be of domestic origin and can be purchased from any miner or producer who has title to the material. Under the new program five tons of ore will be the minimum shipment accepted at the inspection and purchasing depot in Grants Pass, Oregon. No more than 2000 tons a year will be bought from any one source without prior written approval of the government.

Jess Larson, GSA Administrator, said that the program will end June 30, 1955 or whenever 200,000 tons have been received and accepted.

The long range goal of the program is the discovery and development of output in critical metals for defense.



THE GENERAL PATTON TANK

... American Locomotive says 1500 subcontractors supply parts

Subcontractors Move to Boost Share in Defense Jobs

SUBCONTRACTORS are digging their fingers deeper into the pie of defense contracts as industry strives to maintain present production schedules.

Ways and means of digging in were discussed by 100 subcontractors within the aircraft industry and Air Force procurement officials at a meeting in Washington, D. C., last week.

Proposed at this meeting was the rebuilding and distribution on an "urgent need" basis of World War II machine tools now in storage at Air Force depots at Marietta, Georgia, and Omaha, Nebraska. Another suggestion was the re-allocation within the industry to complete production lines of machine tools now leased but not being used by the present holder because of lack of other essential equipment.

A good share of the pie is held by the 1,500 subcontractors, reported by American Locomotive Co. to be pro-

ducing parts for the improved General Patton tank. Some of these subcontractors are small companies with fewer than 300 workers. American Locomotive Co. announced that the new tank is now rolling off the assembly lines at its Schenectady, N. Y. plant.

Also getting a share of defense contracts are the 1765 suppliers assisting Chrysler Corp. in defense projects now on its books. An additional 3000 suppliers of parts are being lined up as the sources of Chrysler's defense production expands. The Department of Defense recently announced that Chrysler will operate a Navy-built \$30 million plant near Detroit for the assembly and testing of jet aircraft engines.

Other contracts awarded by the government, in excess of \$250,000 follow. Added to these are Sigma Corps awards on which no quantity or value data is furnished.

Product

Ammunition Storage Magazines	Armo	Drainage & Metal Products Inc., Berkeley, Calif.
Mine Assembly and Explosive Loading Facilities	Dinwiddie Construction Co.	San Francisco
Components for M31 Clusters	Ed Friedrich Inc.	San Antonio, Tex.
Compressed Air Systems	Hillyer and Lovan Inc.	Jacksonville, Fla.
Sets of Booster Assemblies	Federal Explosive Corp.	New York
Rocket Containers	West Bend Aluminum Co.	West Bend, Wis.
Rocket Motors	McCord Corp.	Detroit
D. C. Motors	Servo-Tek Products Co.	Paterson, N. J.
Torpedo Gyro Course Devices	Francis Metal Products Corp.	Palmyra, N. Y.
Rifles and Shotguns	Ithaca Gun Co.	Ithaca, N. Y.

Contractor

No quantity or value data is furnished on the following:

Power Supply Units	FADA Radio Corp.	Bellville, N. J.
Amplifiers	Gray Mfg. Co.	Hartford, Conn.
Motor Generators	Electro-Engineering Products Co.	Chicago
All Relay Dial System	North Electric Mfg. Co.	Galion, O.
Interphone Equipment	Teleco Industries Corp.	Long Island City, N. Y.
Radiac Meters	Kelley-Koett Mfg. Co.	Cincinnati
Control Boxes	Radio Television Corp.	New Brunswick, N. J.
Test Equipment	Triumph Mfg. Co.	Chicago
Test Equipment	Munston Mfg. & Service Inc.	Islip, L. I., N. Y.

CHECKLIST ON CONTROLS

GOVERNMENT control orders are digested or listed each week in this "Checklist on Controls." For complete copies of NPA orders, write to NPA Distribution Section, First Basement, New GAO Bldg., Washington 25. For copies of OPS orders, contact nearest OPS district or regional office. For copies of OPS news releases, write David S. Phillips, director, OPS Administrative Services Division, Temporary E Bldg., Washington 25.

Materials Orders

RUBBER—Amendment of Aug. 29, 1951, of NPA Order M-2 liberalizes certain provisions effecting manufacturers who consume rubber. Included is the elimination of all controls on consumption of natural rubber latex.

COPPER—Direction 4 of Aug. 31, 1951, to NPA Order M-11 prohibits producers of copper controlled materials from filling any orders after Oct. 1, 1951, other than authorized controlled material orders. This provides the final step in transition to 100 per cent CMP operation in copper for fourth quarter.

BRASS MILL PRODUCTS—NPA Order M-82, effective Aug. 31, 1951, enables warehouses to replace inventories of brass mill products by using allotment symbol X6 to replace products by weight which were delivered during previous month to fill DO and authorized controlled material orders. Distributors whose stocks on the last business day of the month is less than the average monthly inventory carried during the base period Jan. 1, 1947, to June 30, 1950, may place an X6 order on a brass mill for 5 per cent of the difference. The total weight of all orders designated X6 placed in any month cannot exceed 150 per cent of the average monthly weight of his base period deliveries. Order places limitations on orders brass mill must accept and on orders which distributors can accept.

JACKS—NPA Order M-83, effective Oct. 1, 1951, limits production of jacks to certain specified models, sizes, capacities and specifications. Prohibited are about 80 models and sizes now being produced.

NPA Notice

SIGNATURES—NPA Notice 2 issued Sept. 1, 1951, and effective on that date, provides that all official actions of NPA not taken in the name of the administrator or deputy administrator will be taken in the name of NPA, but countersigned by the executive secretary or the recording secretary.

Price Regulations

STEEL SCRAP—Interpretation 1 to Ceiling Price Regulation 5 stipulates that shippers of steel scrap may not use water rates in establishing shipping point ceiling prices if it has been the well-established practice to make shipments by rail. Interpretation 1 was issued Aug. 30, 1951.

DISCRIMINATION—General Overriding Regulation 18 issued by the Office of Price Stabilization permits adjustment of ceiling prices for sellers whose ceiling prices under any Office of Price

Stabilization regulation involve an unlawful discrimination under the Robinson-Patman Act. GOR 18 was effective Sept. 4, 1951.

TUNGSTEN, INDUSTRIAL DIAMONDS—Amendment 10 to CPR Regulation 30, effective Sept. 5, 1951, permits manufacturers that use industrial diamonds and tungsten products in their products to add to their base period prices increases in costs of these materials from their selected base period to Aug. 1, 1951.

STEEL SCRAP—Amendment 5 to CPR 5, effective Sept. 5, 1951, establishes ceiling prices for iron and steel scrap in the United States territories and possessions.

Price Orders Await 'Go' Sign

New price orders on fabricated steel products are held up temporarily at the Office of Price Stabilization, pending the action Congress might take on the President's request for repeal of the Capehart and Herlong amendments.

These amendments permit manufacturers to include in their prices all increased costs, direct and indirect, since the start of the Korean war and which permit distributors to include the same mark-ups.

Majority sentiment appears to be against repeal of the amendments, not only in the Senate Banking Committee hearings, but in the Senate and the House.

Look! No Engine

Here are a string of buggies carrying empty charging boxes from



MOVEMENT WITHOUT AN ENGINE
... cars move by gravity

the open hearth department of Bethlehem Pacific Coast Steel Corp. plant's scrap yard at South San Francisco, Calif.

The string of buggies is given a shove from the open hearth charging floor and leaves by the track shown at the left background. The cars move by gravity until they clear the spring switch shown in foreground.

By this time, the cars have started up hill and have lost their momentum and start down toward the scrap pile.

Just as the cars leave the open hearth department they trip a switch which activates a siren. When they cross an electric eye beam, the siren automatically stops. Just as the cars enter the scrap yard, another electric eye beam turns off a red light in the open hearth building to notify the furnace operators the string of cars has arrived safely. All loading in the scrap yard is done by electro-magnet, one of which can be seen in the background.

Scrap Stays Home in Oklahoma

Using scrap iron from local sources, the first Oklahoma City-made steel was poured into ingots August 29 at the new \$700,000 Hoster Steel Corp. mill (STEEL, June 25, p. 51).

Most of the output of the new mill is expected to go to Oklahoma manufacturers working on defense contracts. The state is a big producer of scrap iron, due to oil field and agricultural activities.

Castings Price Order Postponed

Effective date of the casting price order, CPR 60, has been postponed from Sept. 1 to Oct. 1. In the meantime, OPS will prepare several amendments aimed at permitting full compliance by all castings producers as of the latter date.

Western Miners Convene Oct. 22

Progress in industrial mobilization and its impact on the mining industry will be major topics of discussion when the western division of the American Mining Congress convenes at the Los Angeles Biltmore Hotel Oct. 22-24. Five general sessions and four technical operating symposia are scheduled for the three-day convention, says Harvey S. Mudd, western division chairman and general conference chairman. Attention this year will be focused on manpower problems, labor relations, wages, taxation and means of attaining expanded production to meet defense and civilian needs.

Windows of Washington

By E. C. KREUTZBERG Washington Editor

Industrialists doing a defense stint in Washington get a better understanding of their own industries and learn how to do business with the government

MEN OF INDUSTRY who come to Washington to serve in the defense agencies usually do it at some sacrifice and personal discomfort. But once they get here it is like going for a swim in the ocean. After the shock of the initial plunge, the water turns out to be fine. It isn't only the satisfaction of doing a job with patriotic connotations: the Washington experience yields values not obtainable elsewhere.

"At home I am a sales engineer, and in my regular job I know the business and problems of my small company and what we do and can do for customers," one of these industry men told STEEL. "Here in Washington I have had a view not possible in any other way. I now am familiar with the way our competitors operate, who is who's customer, and why, and the kinds of problems they all have."

"In addition I have learned why the government does business the way it does. I used to think the government was manned by men who did not understand business and I used to call them bureaucrats. Since working with these men in Washington I have found them to be just about the same types you find in private industry—just as honest, sincere and efficient. But they have to work in accordance with specific laws, executive orders and regulations that rob them of the flexibility of the man in industry who, to meet a special situation, merely has to get a decision from his boss.

"When my turn is over I will go back to my job with an understanding of my industry, and an understanding of how to do business with the government, that I could not have gotten in 50 years back home."

A 10 Per Cent Reduction . . .

Four appropriation bills containing the so-called Ferguson-Jenson amendment were signed by the

President. Under the amendment the Agriculture, Interior and Labor departments and a number of government agencies are limited to hiring one new employee for every four vacancies that will occur during the present fiscal year. Congress approved the amendment in desperation after vainly seeking administration assistance in finding ways and means to economize by reducing payrolls. Eventual effect will be to reduce the number of employees in these departments and agencies by 10 per cent.

Keep Your Fingers Crossed . . .

Aluminum users might well keep their fingers crossed about the supply of that metal in the



Wide World

MULTIPURPOSE: A new high speed vehicle soon to be put to use by the Army is the Fageol Twin Coach Convertible. It can operate separately or simultaneously as a passenger vehicle, cargo truck or field ambulance. Engine of the 35-foot-long coach can be repaired from the inside. Looking over engine construction are Col. E. A. Suttles, chief of the Highway Division Office of the Chief of Transportation, U. S. A., and Lou Fageol, president of Twin Coach, manufacturer of the vehicle.

fourth quarter of this year and the first and second quarters of 1952. Because of unusually dry summer weather, production at some primary plants was less than scheduled because of lack of water. And production at secondary plants was curtailed for lack of scrap. The situation is being studied by NPA's Aluminum & Magnesium Division to determine what action should be taken.

The Tax Exempts . . .

If you don't think the Truman Administration is one of the most politically minded within the memory of veteran political observers just listen to what Agriculture Secretary Charles F. Brannan had to say to the Senate Finance Committee. The occasion was in greeting the amendment of the committee to a pending tax bill that would remove the present tax exemption on co-operatives.

"The tentative action of the committee," said he, "in voting discriminatory taxes against farmer co-operatives gives this round to the National Tax Equality Association. But it does not destroy my hope and belief that the decisive rounds to come will result in victory for farmers. . . . The government would now begin to penalize farmers' co-operatives which are successful; establishment of new co-operatives would, for all practical purposes, prevent."

Secretary Brannan does not mention that the tax-free co-operatives have been thriving at the expense of private, tax-paying businesses whose business has suffered through that kind of competition. Nobody knows exactly how much business the farm and labor co-operatives do, but it is said to be somewhere between \$16 and \$2 billion a year. Incidentally, Col. Stam, tax expert for Congress, estimates that fully 50 per cent of the total income of co-operatives—or \$8 to \$10 billion on the basis of the above estimate—would become taxable under the amendments of the Senate Finance Committee.

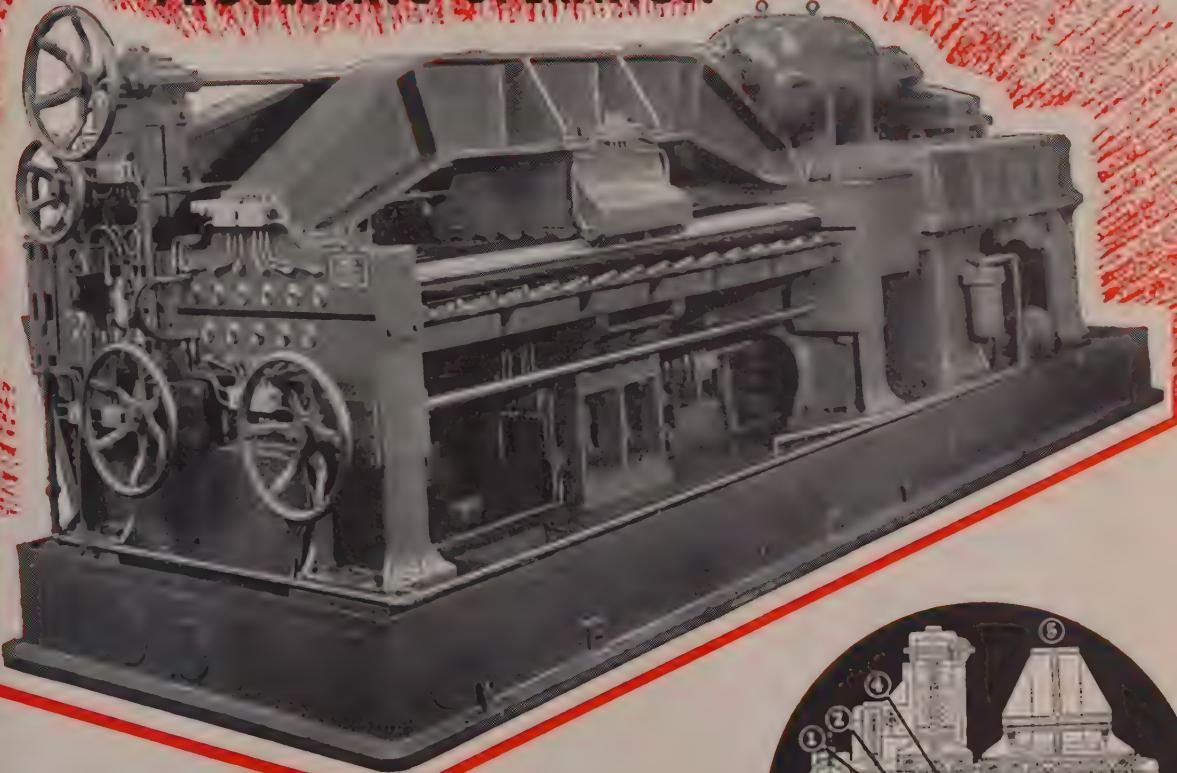
TO THE **Stamping Trade:**

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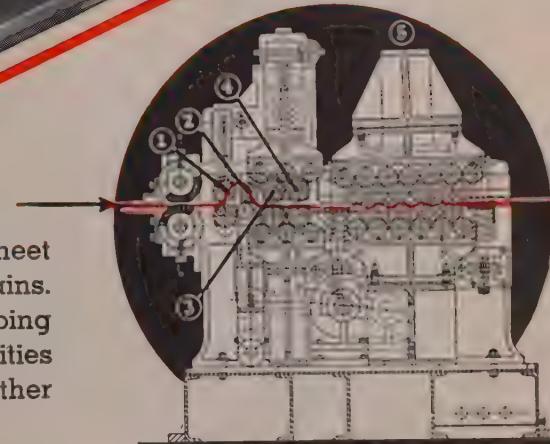
*'You cannot afford to be without
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Sheets processed in the Budd-McKay Sheet Processing Machine are free of stretcher strains. For this reason they have far superior stamping and drawing qualities, and retain these qualities much longer than sheets processed by any other method.



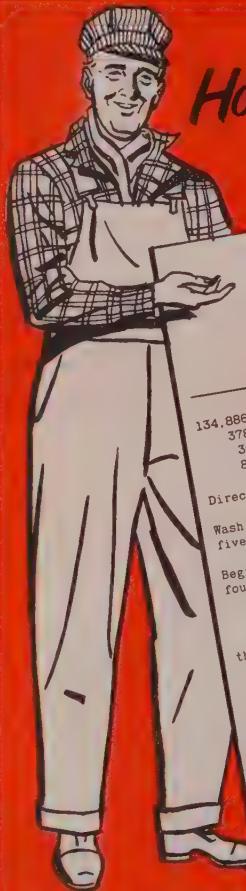
dentally HAVE YOU REVIEWED YOUR
METAL FINISHING COSTS LATELY?

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- (1) Represents Hold-back Rolls
- (2) Flexing Roll
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How about comparing
this switching record with yours?

COMPARISON OF OPERATING COSTS OF LOCOMOTIVES FOR YEAR
BASED ON MONTHLY AVERAGE
APRIL 1951

STEAM LOCOMOTIVE		Year
134,886 Gal. Fuel Oil		5563.84
378 Gal. Lubricating Oil		209.46
30 Gal. Kerosene (1949)		3.90
80 Lb. Grease		7.20
Direct Repairs (Average for 20 years)		2023.94
Wash out boiler and blow flues once each five weeks (four men on premium day)		681.60
Beginning of each week engineer started four hours before time crew started.		590.72
Total		\$9100.66

The cost per gallon used in determining the yearly average of fuel oil used in the steam locomotive is based on the last year it was in operation. All other rates used are current averages.

LOSS IN SERVICE TIME- (ESTIMATED)

STEAM LOCOMOTIVE		Year
Load up with water		840.0 hours
Load up with fuel oil		240.0 "
Estimated time off track		60.0 "
Total		1140.0 hours

DIESEL LOCOMOTIVE		Year
13,296 Gal. Diesel Oil		462.36
493 Gal. Lubricating Oil		310.59
40 Gal. Spirits		6.40
74 Lb. Grease		6.72
Direct Repairs (19 mos. \$904.25)		571.08
Not necessary		—
Not necessary		—
Total		\$2357.35

DIESEL LOCOMOTIVE		Year
Not necessary		120.0 hours
Load up with diesel oil		3.0 "
Estimated time off track		123.0 hours

AT GENERAL STEEL CASTINGS CORP.
EDDYSTONE PLANT



NOTE!

SWITCHING COSTS SLASHED 74%
DOWN-TIME REDUCED 89%

Annual cash savings in the switching operation at General Steel Castings Corporation up \$7000! Availability of the locomotive increased a thousand hours annually!

Money-saving records like these, plus cleanliness, employee comfort and satisfaction, operating flexibility and other advantages of modern motive power, account for the growing popularity of Whitcomb Diesel Locomotives.

With material and labor costs on the increase, management today is seeking every available means to introduce new operating economies. In *your* case, perhaps, a new Whitcomb may partly solve the problem of mounting costs. When may we talk to you about your locomotive needs?

The Whitcomb Locomotive Company
Rochelle, Illinois

SUBSIDIARY OF BALDWIN-LIMA-HAMILTON CORPORATION

YOU CAN DEPEND ON WHITCOMB FOR FINE PERFORMANCE
DIESEL LOCOMOTIVES



ECA Shifts Emphasis to Productivity

Until a while ago, ECA was exporting American things—foodstuffs, equipment—to Europe. Now, more stress will be on exporting American know-how

ECA IS aiming from a different position at its target of complete European economic recovery.

That's because the bull's eye is a little more difficult to hit now that the changed military situation has obscured the view. Until a while ago, the ECA emphasis was on the export of American things — foodstuffs, equipment, fuels—to Europe. Now the emphasis is the export of American know-how to Marshall Plan nations. Even without Russian belligerence, ECA would have shifted to more technical assistance in its last year which ends next June 30, but the change has been accelerated by the need to backstop direct American military aid.

Two Approaches—As it looks now, two major methods will be used to give technical assistance. One will be the increased use of foreign teams visiting the U.S. to get productivity tips. That procedure is already well established and will be refined. The second approach—just being initiated—will be the establishment of a pool of American engineers in Paris to help with productivity problems. Other techniques—not yet fully developed—include the setting up of training schools here to teach European technicians American methods and encouragement of more private U.S. investment abroad.

Since March, 1949, when the productivity team idea was first started, 4900 Europeans have come over here on 625 projects. The British were the first to take to the scheme and have now sent more than 100 teams to the U.S. The French got a later start, but their 100th team began a tour Aug. 26. That group is studying U. S. methods of increasing productivity in the manufacture of machine tool accessories and power hand tools. The majority of the teams from all Marshall Plan nations have represented metalworking industries. The whole program will be accelerated between now and next June 30 when 5000 more Europeans will visit this country to study productivity. In less than 10 months more will arrive than in the first 29 months of the program.

Other Side of the Coin—A corollary program to the team scheme will be the engineers' pool in Paris. For the time being just 15 engineers will be

in that pool, but eventually 60 to 100 will be available. Their duties will be as trouble shooters. They'll go anywhere in Marshall Plan nations to advise and assist on productivity problems. The engineers will consist of two types: Men with top management experience and men with particular knowledge on special phases of production. A few productivity teams from America to Europe will also be used. Already several have gone across, including groups representing U.S. foundries, pressed metal companies and cotton manufacturers.

Has the productivity team plan paid off thus far? Evidence indicates yes. Deritend Stamping Co., Birmingham, England, which had a representative in a drop forging and stamping group, has achieved a 50 per cent production boost by installing the latest materials handling equipment and using American advice on the lubrication of dies. Machine Tool Research & Testing Laboratory, a French government organization at Issy-les-Moulineaux, has boosted its productivity by studying American lab methods, despite the fact that most of its 75 workers are members of CGT, a pro-Communist union that

openly opposes productivity ideas. Ste. Ame John Cockerill, one of the largest heavy forging plants in Belgium, sent its Chief Engineer Adolphe Paulus on a Belgian team. One thing he learned was the economy of motion in America. Here a drop forge finishes off a product with four motions, where the Belgians use ten to get the same result. A small Dutch plant making electric fans and beauty parlor equipment boosted productivity 20 per cent in a year because of a study of American standardization of fans and motors.

Tough Nut—One of the most difficult problems facing ECA is the matter of greater U.S. investment abroad. No one has yet begun to solve it, but ECA will try. As the first step to carry out the program, the agency has appointed Wayne Chatfield Taylor as special consultant. He has been fiscal assistant secretary of the Treasury, under-secretary of Commerce and president of the Export-Import Bank of Washington. His job will be to help ECA study what it can do toward solving the difficulties.

In addition to long-range productivity programs, ECA will sponsor one-shot affairs designed to aid in exporting U.S. know-how. One such undertaking will be the visit here of more than 200 European industrialists from Nov. 18 to Dec. 4. Their visit will include a 12-day survey and discussion tour of a cross-section of U.S. plants, sponsored by ECA and arranged by the National Manage-



ORIENTAL ORIENTATION: Shipping and shipbuilding, long mainstays of the Nipponese economy, got another boost when the *Akagi Maru* was launched by the Japan Heavy Industry Co. in Yokohama, Japan. The nation's merchant fleet was skeletonized by Allied bombs and torpedoes from 6.7 million gross tons in 1941 to about 1.6 million tons at the end of the war—and only half of that was serviceable. The islands today have capacity to construct 800,000 tons yearly, and are seeking to establish themselves on a self-supporting basis

ment Council. The tour will be followed by the First International Conference of Manufacturers, a two-day session sponsored by the National Association of Manufacturers in cooperation with ECA. The conference will be held at New York's Hotel Pierre. The National Management Council, in charge of the plant tour, represents U.S. management associations and individual companies in international affairs.

Reinforcing Bars: Harder To Get

Fabricated metal concrete reinforcing bars will be changed from a Controlled Materials Plan Class "B" product to a Class "A" product Oct. 1.

For delivery on and after that date, the fabricator must obtain an allotment from his customer. Previously the fabricator received this allotment from NPA and placed orders for steel concrete reinforcing bars as controlled materials with the steel mills. He was not required to obtain an allotment from his customer who bought them from him as a Class "B" product.

These bars will have to be figured as part of the total amount of steel used in construction. This will tighten up on the use of this product. Use of structural steel has been prohibited in construction of small housing units but the fabricated bars could be used by a builder to get around the ban on the use of structurals. Furthermore, builders of large projects previously could buy the bars without controlled materials allotments and use them without adding to the project's total amount of steel.

Switch Makers Ask Price Help

A tailored pricing regulation for the frog, switch and crossing manufacturers was recommended by their industry advisory committee to the Office of Price Stabilization.

To speed consideration of such a regulation, the committee appointed a four-member subcommittee scheduled tentatively to meet Sept. 11 in Washington with OPS officials.

Products of this industry are covered now by Ceiling Price Regulation 30 (Machinery). Committee members agreed that the pricing technique of this regulation is difficult to apply to the products of their industry and would distort the industry price structure. A large percentage of the units made by the industry are built to individual specifications required by railroad and industrial customers.

The industry's labor and materials cost ratios vary greatly, depending on

the mechanical and metal requirements of each individual unit being produced.



BIG WELDING DEMAND
... heat is on rod makers, too

Big Year for Welding Rod

There'll be 50 per cent more welding rod in '51 if first half output rate continues

DEFENSE production is doing well, at least according to one good indicator of armament activity: Welding rod production.

Output of electrodes this year should be about 50 per cent higher than the 400 million pounds turned out in 1950 by 20-odd members of the welding rod industry. The estimate is based on shipments reported to National Electrical Manufacturers Association by 13 member companies representing 90 per cent of the industry's capacity.

Arithmetic—Shipments of welding rod in the first six months this year amounted to 264 million pounds, NEMA figures. In the same period last year they were 166 million pounds. Even though July turnout was only about 26 million pounds and August operations weren't up to par, NEMA will likely report shipments of over 500 million pounds in 1951. That means the entire industry will produce close to 600 million pounds of the vital rod this year—highest output since 1945. It won't be a record though: 1943 production was 1 billion pounds.

Rosy as the shipments picture looks, and despite the fact that most industry men expect business this year to

be 25 per cent better than last, all is not sweetness and light within the industry. Deliveries take at least four months today and manufacturers are stymied by short wire supplies. The backlog figure is probably padded by duplicate orders on producers' books, though.

Opinion—Welding rod makers believe they could work off the backlog easily if more materials were forthcoming. They say their ability to boost production isn't limited by physical capacity; drawing, cutting and coating capacity is more than adequate, and most plants have been able to hold their workers. Industry consensus is that CMP will have long-range benefits in clearing supply channels. Welding rod has a B product listing under CMP.

Government officials take a different view on expansion of production. NPA's Welding Section, Metal Working Equipment division thinks the boost in output this year will easily be sufficient to fill demand for rod. Reasoning is that sheet steel and plate production has not increased enough to warrant any larger allocations of tight metals. Much of the hue and cry for more rod comes from distributors whose stocks are emptied soon after shipments arrive, says NPA. The agency points out that much of the shortage can be traced to emergency allocations for such projects as pipeline laying, freight car building and ship construction eating into present supplies.

History—Mild steel electrodes have historically accounted for an overwhelming portion of total production, even during wartime. The ratio of alloy rod is inching upward slowly, but the proportions haven't changed radically yet. If a major tank or shipbuilding program is initiated, it will take a lot more of the alloy types. Much research since the war has centered on development of a suitable process for welding alloys with mild steel electrodes.

For every ingot ton of steel produced in 1950, industry needed 4.2 pounds of electrode. Since 1936 the ratio has varied from 2 to 12.2 required in 1943. Today producers estimate about 7 pounds is needed per ingot ton of steel poured to fill rated and civilian orders. The formula would be better replaced, says NPA, with one based on sheet and plate production, since they are the products joined by the rod. Under that system the ratio has varied since 1936 from about 8 to 47 pounds of electrode per ton of plate, shape and sheet. Some 16 pounds per ton were used in 1950. NPA has the formula in mind when pegging output of welding rod in our part-war, part-peace economy.

Who's Who in NPA's Industrial & Agricultural Equipment Bureau

IF YOU HAVE OCCASION to get in touch with Washington for answers to questions about problems in your industry, here's a directory of key personnel and product assignments in the Industrial & Agricultural Equipment Bureau. It is the unit of National Production Authority with the responsibility for all major products of the metalworking field. Most of the names shown are those of men well-known in their respective industries, and they are well-equipped to answer any questions that have to do with production. All men are located in the New GAO Bldg., and can be seen or addressed as indicated, or can be telephoned at STerling 5200 on the indicated extensions.

NATIONAL PRODUCTION AUTHORITY Industrial & Agricultural Equipment Bureau

New GAO Bldg. STerling 5200
Assistant NPA Administrator for Industrial & Agricultural Equipment: Franz Stone, Ext. 3391, Room 3H16
Deputy Assistant Administrator: Frank Shields, Ext. 3391, Room 3H16
Information Officer: Robert Burkhardt, Ext. 5146, Room 3H16
Agricultural Machinery & Implements Division, Room 3F7

Director: Curt L. Oheim, Ext. 5105.
Deputy Director: John Ransom, Ext. 4922.
Tractor, Harvesting & Tillage Tools Branch Chief: Robert D. Merrill, Ext. 4480.
Dairy & Barnyard Branch Chief: James Crofoot, Ext. 4530.
Miscellaneous Farm Equipment Branch Chief: Robert Terry, Ext. 3703.

Construction Machinery Division, Room 3D6
Director: Myron B. Garber, Ext. 4196.
Deputy Director: Everett Wilcox, Ext. 4196.
Tractors & Tractor-Mounted Equipment Branch Chief: Ralph L. Schiesswohl, Ext. 4529.
Cranes & Shovels (except tractor-mounted) Branch Chief: D. J. Conway, Ext. 5054.

Motor Graders & Off-Highway Equipment Branch Chief: J. F. Sims, Ext. 4598.
Concrete & Bituminous Processing Equipment Branch Chief: Bob Howe, Ext. 5170.
Miscellaneous Equipment & Spare Parts Chief: William L. Davies, Ext. 5210.

Program & Requirements Branch Chief: Oren A. Prather, Ext. 5659.

Electrical Equipment Division, Room 2N14

Director: Bonnell W. Clark, Ext. 3256.
Deputy Director: Luther D. Hank, Ext. 3257.
Assistant to Director: H. E. Way, Ext. 3350.

Program & Requirements Branch Chief: C. G. Laslie, Ext. 5410.

Outside Distribution Branch Chief: D. A. Griffith, Ext. 3938.

Pole Line Equipment Section Chief: R. C. Boyles, Ext. 4260. Assistant, T. A. Bonner, Ext. 4260.

Switchgear Section Chief: R. N. McCollom, Ext. 4280. Assistants, E. J. Norrett and I. J. Kovach, Ext. 3120.

Transformer Section: L. H. Walke and G. W. Cooper, Ext. 3939.

Scheduling Engineer: E. M. McManus, Ext. 3939.

Motor and Control Branch Chief: S. H. Kellett, Ext. 3947.

Miscellaneous Equipment Section: H. G. Mitchell, Ext. 4452, A. C. Tait, Ext. 3093.

Motors and Generators Section Chief: R. L. Kingsland, Ext. 3095.

Expediting Section Chief: R. C. Wareham, Ext. 3095.

Lighting & Interior Distribution Branch Acting Chief: E. S. Milligan, Ext. 5657.

Wiring Device Section: L. Alan Sharp and Thomas E. Cornell, Ext. 4117.

Lighting Equipment Section: J. H. Brundage, Ext. 4138; Hugh Estes, Ext. 4168; John N. Payne, Ext. 4129.

Engine and Turbine Division, Room 2-O-14

Director: Charles F. Kells, Ext. 4202.
Deputy Director: E. J. Hand, Ext. 4202.
Steam Turbine Section Chief: F. J. Robinson, Ext. 3937.

Boiler Section Chief: Frank X. Gilg, Ext. 4888.

Condenser Section Chief: M. J. Kilroy, Ext. 4707.



FRANZ T. STONE

Assistant NPA Administrator
Industrial & Agricultural Equipment

Hydraulic Turbine Section Chief: George Hochwalt, Ext. 4810.

Internal Combustion Engine Section Chief: R. N. Tate, Ext. 4811.

Water Softener Section Chief: E. H. Aldworth, Ext. 3310.

Heavy Metal Tanks & Pressure Vessels Section Acting Chief: George Conners, Ext. 3326.

Fabricated Pipe Section Chief: Tom Owen, Ext. 3946.

Coordination Branch Chief: E. P. Welch.

Program & Statistics Branch Chief: George Roewe, Ext. 3945.

General Components' Division, Room 3A7

Director: Samuel N. Comly, Ext. 5141.
Deputy Director: Eugene F. McCarthy, Ext. 5141.

Assistant Director: Lindsay C. Howell, Ext. 5141.

Assistant Director: James P. Baldwin, Ext. 5141.

Formed & Machined Products Branch Chief:

Robert M. Smith, Ext. 4029. (Bolts, nuts, screws, washers, screw machine products, springs, stampings, etc.)

Antifriction Bearings Branch Chief: Donald M. Davidson, Ext. 4045.

Valves & Fittings Branch Chief: Charles W. Burrage, Ext. 4850. (Valves, pipe fittings, hose fittings, gaskets, packing, etc.)

Industrial Specialties Branch Chief: C. A. Goldstrohm, Ext. 4837. (Chain, marine supplies, chain fittings, wire cloth, casters and wheels.)

Mechanical Power Transmission Branch

Chief: Maurice G. Jewett, Ext. 4877. (Sprocket chain, conveyor chain, gears, pulleys, clutches, couplings, belt lacing, shafting, sleeve bearings, etc.)

Tools Branch Chief: A. N. Berbatis, Ext. 4847. (Saws, files, vises, wrenches, pliers, agricultural hand tools, railroad maintenance tools, mechanical hand tools, etc.)

Program & Requirements Branch Chief:

Harry S. Mills, Ext. 3676.

General Industrial Equipment Division, Room 3D7

Director: Walter E. Schirmer, Ext. 5466.

Deputy Director: William L. Beck, Ext. 4874.

Materials Handling Equipment Branch Acting Chief: Joe H. Peritz, Ext. 3860.

Special Industries Machinery Branch Acting

Chief: James A. Lawson, Ext. 5704. (Food, chemical, printing, woodworking, textile and pulp and paper machinery mainly.)

General Service Machinery Branch Acting

Chief: James W. Anderson, Ext. 5703. (Pumps, compressors, fans, dust collectors, industrial refrigeration machinery, etc.)

CMP Branch Acting Chief: Robert K. Oakley, Ext. 4613.

Metalworking Equipment Division, Room 3H14

Director: H. L. Tigges, Ext. 4687.

Deputy Director: P. L. Houser, Ext. 5857.

Assistant to Director: Paul S. Gaston, Ext. 4629.

Consultant to Director: Marshall M. Smith, Ext. 4687.

Adviser to Director: Swan E. Bergstrom, Ext. 4626.

Industries Branch Chief: Paul W. Norris, Ext. 4527.

Materials & Components Section Chief: Joseph G. Fitzgerald, Ext. 3262.

Abrasive Products Section Chief: Ralph O. Anderson, Ext. 4779.

Cutting Tool Section Chief: Wiley T. Buchanan, Ext. 5285.

Precision Measuring Instruments Section Chief: E. J. Masterson, Ext. 4803.

Welding Equipment Section Chief: Dale Spoor, Ext. 4814.

Foundry Equipment & Supplies Section Chief: Francis E. Fisher, Ext. 4804.

Metal Tool Cutting Section Chief: Fred Crosby, Ext. 4827.

Machine Tool Forming Section Acting Chief: Paul W. Norris, Ext. 4527.

Industrial Heating Equipment Section Chief: Carl L. Ipsen, Ext. 4813.

Wire Drawing & Rolling Mill Equipment Section Chief: Joseph G. Fitzgerald, Ext. 3282.

Light Power-Driven Equipment Section Chief: Herbert A. Newman, Ext. 4802.

Machine Tool Attachment & Accessories Section Chief: Oscar Iber, Ext. 4802.

Tools, Dies, Jigs, Fixtures Section Chief: P. R. Marsillus, Ext. 4801.

Production Control Branch Chief: Thomas J. Shriver, Ext. 5708.

Pool Order Section Chief: Robert M. Husband, Ext. 5909.

Program & Requirements Branch Chief: John Gibbons, Ext. 3978.

Used & Available Tools Section Chief: William S. McCormick, Ext. 4200.

Order Board Section Chief: E. Payson Blanchard, Ext. 4506.

Priorities & Distribution Section Chief: Harry F. Hawkins, Ext. 4370.

Diversion & Substitution Section Chief: Edgar Grossman, Ext. 4130.

Motor Vehicle Division, Room 3H10

Director: Courtney Johnson, Ext. 5495.

Deputy Director: Robert Cass, Ext. 3472.

Assistant to Director: Fred L. Glover, Ext. 5521.

Assistant to Director, and CMP Officer: George R. Davis, Ext. 3471.

Transit Vehicle Branch Chief: William J. Cummings, Ext. 3763.

Automobile Branch Chief: George R. Curtis, Ext. 3851.

Trailer Branch Chief: Elbert J. Lucas, Ext. 3751.

Truck Branch Chief: Raymond H. Fussell, Ext. 4161.

Engine Branch Chief: Thomas H. Stambaugh, Ext. 3839.

Replacement Parts Branch Chief: Lawrence Beerman, Ext. 5537.

Automotive Maintenance Equipment Branch

Chief: Arthur R. Laney, Ext. 3868.

Priority Assistance & Tax Amortization

Branch Chief: S. Elmore Rucker, Ext. 5746.

Railroad Equipment Division, Room 3H12

Acting Director: Robert L. Glenn, Ext. 5184.

Deputy Director: Mat K. Tate, Ext. 5185.

Locomotive Branch Acting Chief: Frank J. McShalley, Ext. 3913.

Rolling Stock Branch Chief: Stanley Brown, Ext. 3913.

Transit Branch Chief: David A. Depue, Ext. 4755.

Maintenance of Way and MRO Branch

Chief: George Sitten, Ext. 3024.

Assistant Chief for MRO: Francis H. Winger, Ext. 4043. Assistant Chief for Maintenance of Way: C. S. Roberts, Ext. 3024.

CMP Branch Chief: Lewis Malcolm, Ext. 3470. Assistant Chief for CMP: Albert J. Wolken, Ext. 4679.

Mining Equipment Division, Room 3E7

Director: H. A. Montag, Ext. 5017.

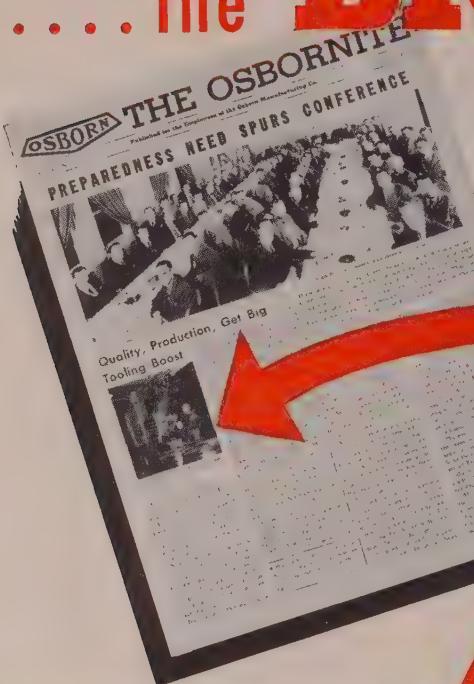
Deputy Director: L. M. Case, Ext. 5018.

Rock Machinery Branch Acting Chief: Paul R. Moyer, Ext. 4430.

Coal Machinery Branch Acting Chief: Glen R. Parker, Ext. 4470.

CMP Section Chief: O. J. LaBell, Ext. 4320.

....the "BIG BOOST" in tooling....



From "The Osbornite" published by and for the Employees of the Osborn Manufacturing Company, Cleveland, Ohio.

Chuck Corwin reads greeting card rigged up by co-workers on his new Bullard Cutmaster.



Quality, Production, Get Big Tooling Boost

How would you like to get a 16-ton Christmas present? That's what happened to Chuck Corwin (Machine Shop). Such a gigantic piece of equipment was this gift, that Chuck decided he'd have to leave it here at the plant where he could enjoy it during the day's working hours.

Now 32,000 pounds worth of heavy machinery is a very unusual kind of Christmas present for one man, but in the case of Chuck's new machine—the big 36" Bullard Cutmaster, all of us can get a lot out of it in more ways than one.

Installation of this major piece of plant machinery can be counted on to consolidate more firmly our ability to produce more. It can handle tooling of larger parts than we have been able to make up to now so it will increase the scope and range of the Moulding Machines we can sell to our customers. And that, in turn, certainly benefits us all.

Without getting too technical, we'd like to tell a little about what this new Bullard can do and how it does it. First, let's take that designation, "36". It refers not to the size of the machine itself, for anyone can see that it takes up space from the floor almost to the ceiling of the Machine Shop. Thirty-six inches refers simply

to the size of the working table on which the machinist tools his metal. This Bullard will turn, bore and face Moulding Machine parts at speeds ranging from four revolutions per minute all the way up to 210 r.p.m. You can have two tools in work at one time on this mill by using the side jack and the turret head simultaneously.

Yes, we can all expect great things from this Bullard Cutmaster which, incidentally is the third such mill to be installed recently. One of the others has a 54" table for tooling even bigger parts for our Moulding Machines. All are controlled in the hydraulic system by solenoid action, and accommodate the newest type carbide tooling.

THE
BULLARD
COMPANY
BRIDGEPORT 2,
CONNECTICUT

The eight top body designs awarded prizes in Fisher's contest show nothing particularly radical in styling or rear engine construction is desired by young America

DETROIT

LOOK at the model cars designed and built by the eight youngsters who were top winners in Fisher Body's Craftsman's Build Guild contest and you will realize that automobile styling has reached a plateau.

One thing is immediately obvious from the prize-winning entries: Cars of the nearby future will not be significantly different looking from today's. The hard-top convertible's lines and glassiness are evident, there are no indications that "tear-drop" styling or rear engine design is desired by young America. All of the winning models are notable for their lack of freakishness.

Echo—Listen, too, to Kaiser-Frazer's vice president in charge of engineering, Dean Hammond, discussing "tomorrow's car." He indicates that the present type of reciprocating engine will be in use for some time. It will be in materials where the biggest change from today's car will come.

Stop expecting any drastic reduction in overall size of height from present designs. The passenger's comfort and safety is being considered today more seriously after the interlude during which bumped heads and cramped legs were secondary considerations.

Mass Market Counts—You can bank on the fact that sport cars of the Nash-Healey and Crosley Hot-Shot variety will have a substantial following among young-bloods and the not-so-young who have the wherewithal to indulge their whims and whose practicality has been overshadowed by the urge to be different. But this type of car will never get far beyond the plaything stage. General Motors could sell dozens, possibly hundreds, of its "Le Sabre." But it couldn't sell them to most of the people who buy Chevrolets and it is doubtful that many Cadillac



DOUBLING UP: Hundreds of milling and fabricating machines for aircraft work form a background for Kaiser and Henry J trim assembly line in this 2000-foot bay at Kaiser-Frazer's Willow Run plant. K-F's aircraft program includes making Fairchild C-119 cargo and personnel planes, Wright R-1300 aircraft engines and components for Lockheed naval patrol bombers

buyers would be more than remotely tempted.

America's mania for speed can pretty well be satisfied with cars available today. In safety men's opinion present-day cars are traveling faster than road conditions permit, and even the lowest powered automobiles can be driven to within 20 mph of the most powerful. If uniqueness is sought, it's obtainable with no effort in such cars as the Muntz Jet or by using ingenuity in custom conversions, the term applied to hand-made modifications of standard models.

Emphasis on Engineering—This is not to say that the automotive industry's engineering and styling sections have assumed static roles. The former is more dynamic now than at any previous time. Research work being done by nearly

all automakers is at a peak, and has branched out into fields quite distantly removed from automobile problems. Examples of this preoccupation with engineering and basic research are at hand all around Detroit; i.e., Ford staffing its new scientific laboratory with top-notch men whose interests have ranged from refrigeration to isotopes; General Motors rushing construction of its technical center; Packard, General Motors and others expanding their proving ground facilities.

Defense Damper on New Models

Defense activity has put a damper on some of the new model work. It has moved some important changes in body and engine design and execution back a year, and in some cases has resulted in their shelving entirely. New model introduction dates are extremely hazy for nearly all makers. The usual November-December-January hustle-bustle when makes of the big three usually get into dealers' showrooms may stretch out over several more months. One new car—Willys five-passenger moderately small (109-in.) wheelbase car—continues to be an enigma. Orders for some of the components of this car were followed recently by cancellations and although President Ward Canaday tells stockholders that the car will be produced, he is not saying when. Rumor early this summer was that September was the month, now late in the year appears to be a better bet.

Ford Appearance a Secret

Ford is making a move aimed at keeping the looks of its 1952 cars a secret. It is building an eight-foot high brick wall flanking its Dearborn test track.

There used to be a fairly lively traffic in pictures of Fords before their introduction date, Fords being exploited more than most other makes because of the ease with which they could be photographed from the heavily traveled road

which adjoins the track. Other car makers don't have quite the same problem, their models are tested in less conspicuous places.

K-F Peek-a-Boo Different

Kaiser-Frazer is playing peek-a-boo of a different sort. Like the rest of the industry they have new models, about which they are being very close-mouthed at the moment. They are more inclined to talk about development work of a longer-range nature. It's been no secret that they are doing a great deal of experimental work with aluminum, although more is known about their aluminum engine research than their light-weight body experiments.

John Hallet, executive vice president, says the engine program has been under way for four years and embraces tests on valve-in-head four and six-cylinder designs and V-6s and V-8s of various horsepowers. The research "may ultimately provide a saving in engine weight of over 50 per cent and substantial gains in performance and fuel economy," he asserts. Aluminum is envisioned for engine blocks, cylinder heads and clutch housings. One especially notable aspect of the K-F program appears to be its interest in four-cylinder engines. Demand for the four-cylinder Henry J., says Mr. Hallet, discloses a vast growing market. He points to registration figures as proof that they have caught on, citing a doubling in sales of four-cylinder cars in the U. S. in a year's time.

One all-important reason for there being no chance of a mass conversion by the automobile industry to all-aluminum construction for bodies in the near future is supply of that material. According to K-F researchers, the industry's requirements would be in excess of aluminum producers' peak output, but their thinking is that possibly in ten years time, aluminum will be the metal. To scoffers who mention the cost factor, an aluminum producer's remarks to another automaker are worth repeating. Said he . . . "You give us the order for sheets to make blank million blank cars, and the price will be competitive with steel."

Auto, Truck Output

	U. S. and Canada	1951	1950
January	645,688	609,879	
February	658,918	505,593	
March	802,737	610,680	
April	680,281	585,705	
May	695,898	732,161	
June	653,673	897,853	
Six Mos.	4,137,195	3,941,878	
July	527,502*	746,801	
August		842,335	
September		760,847	
October		796,010	
November		833,784	
December		671,622	
Week Ended		1950	
Aug. 11	97,351	182,965	
Aug. 18	129,661	190,879	
Aug. 25	139,115	179,042	
Sept. 1	139,553	188,072	
Sept. 8	105,000*	149,742	

Sources: Automobile Manufacturers Association, Ward's Automotive Reports. *Preliminary.

There may be more to the rumor about one automaker helping finance an aluminum producer's expansion than someone's overactive imagination.

Hudson Gets Defense Job

Tip-off that Hudson had received a new defense contract was to be found in the "help wanted" pages of Detroit papers. The ad read "Artist, perspective—to make pictorial illustration for airframe construction." Days later the company announced it had received an offer from Glenn L. Martin Co. to engineer, tool for and manufacture rear fuselage and tail sections for the B-57 Canberra jet bomber, the plane which ten days ago set a new unofficial record for the Atlantic crossing, bettering the record set in February by the same British-designed ship.

That's the second defense order for Hudson. In May it received an order for major components of the R-3350 reciprocating engine from Wright Aeronautical Corp.

The company will use existing facilities in Detroit for these two orders. It expects to devote about a quarter million square feet to them and according to A. E. Barit, president, the defense work will not interfere with automobile production schedules.

The Canberra was originally designed by English Electric Co.,

Ltd. as a high altitude radar bomber. The U. S. Air Force plans to use it as a "Night Intruder."

While tooling up for these contracts, the company also will be building its new "hard-top". Named the Hollywood, the new body design retains all the other Hudson features and incorporates the surrounded-in-glass appearance which has made this style popular beyond all precedent.

Center posts have been eliminated to give the vision and airiness which characterizes this type of styling. The model is available in the Hornet, Commodore Custom and Super-Six Custom series.

Plymouth Has One, Too

Somewhat comparable with Hudson's new airframe contract is that which Chrysler Corp. booked for its Plymouth Division, Evansville, Ind., plant. Hulls for the Grumman Albatross amphibious air rescue plane are to be built there, and final assembly has begun now on the first complete unit. Portions of all major subassemblies are in production and more than half of the heavy fixtures needed for the job have been received.

Getting ready for this work has meant several changes in the Evansville facility. For one thing, structural changes have had to be made to accommodate the 60-foot long, 8-foot wide and 12-foot high hull. It weighs more than two tons. Rather than build a new structure to house the defense work it was decided that the Plymouth suburban body would be farmed out to Briggs at Evansville, thus freeing about 2,000,000 square feet of Plymouth's plant for the operation. The other 300,000 square feet in the facility will continue making passenger cars.

Presently engaged on the Albatross project are 700 workers, a number which will about double when volume output is reached.

The Albatross contract and other defense work which Chrysler is undertaking has resulted in the addition in the last three months of more than 500 companies to its list of suppliers, Joseph Pfeiffer, director of purchases, announces.

The Business Trend

Pulse of business beats faster and industrial production index inches slowly upward to its highest point since late June

FUEL under the production pot in recent weeks hasn't set it boiling yet, but there is a noticeable simmer.

Labor Day recesses will surely take their toll of production—industry is still tabulating the exact amount—but the week before was heartening to those awaiting that fall pickup in business. It showed the fastest activity tempo since the latter part of June. As measured by STEEL's industrial production index, activity in the week ended Sept. 1 edged up to 216 per cent of the 1936-1939 average. The two preceding weeks were only slightly less productive: Revisions brought their final totals to 214.

Increase in the latest week's mark was accounted for entirely by a boost in steelworks operations. Mills in that week were again operating at capacity, STEEL estimates. All other components of the index lent the same relative weight. Last year the index was also at the 216 perch, but auto assemblies and freight car loadings were higher. These losses were

made up this year by capacity steel-works operations and exceptionally high electric power output.

Rise in Steel Pourings...

Raw steel produced during August should total close to 7,900,000 net tons, unless actual operations again fall below weekly scheduled rates as reported to American Iron & Steel Institute. Assuming that August output approximates the estimate, domestic mills will have spewed forth close to 70 million tons of ingots and steel for castings in the first eight months of 1951—a full month's production above the 63,449,688 tons of raw steel poured in the same period last year. Schedules for the week ended Sept. 8 called for production of 1,965,000 tons.

Four Million Autos...

Auto production, like the activity index, is at its best level since June. Output of 139,553 car-truck assem-

blies in U. S. and Canadian plants in the week ended Sept. 1 is still far from the 188,072 built in the like 1950 week.

Early this week the four millionth car of the year will leave some U. S. assembly line, says *Ward's Automotive Reports*. In 1950 that milestone was reached in early August. September should see some 362,000 passenger assemblies, says *Ward's*. This would be a new low for the year and nearly 42 per cent below September, 1950. August's yield was 423,000 units. From present projections it appears that the third quarter will produce about 1,161,000 cars. If allocations for fourth quarter are unchanged, 1951 should be the second best production year in history, despite a 20 per cent drop from the 1950 performance.

Employment on Upgrade...

About 104,000 more people were working in August than in July, the Census Bureau reports. The increase—to 62,630,000—is only slight, the agency believes. It raises employment 263,000 above the level prevailing a year ago, and reduces the number of jobless to the lowest point

BAROMETERS of BUSINESS

	LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
Steel Ingot Output (per cent of capacity)†	100.0	98.0	102.0	97.5
Electric Power Distributed (million kilowatt hours)	7,025	7,077	7,003	6,459
Bituminous Coal Production (daily av.—1000 tons)	1,802	1,715	1,704	1,834
Petroleum Production (daily av.—1000 bbl)	6,240	6,220	6,201	5,760
Construction Volume (ENR—Unit \$1,000,000)	\$257.4	\$188.9	\$267.6	\$342.5
Automobile and Truck Output (Ward's—number units)	139,553	138,797	117,010	188,072

*Dates on request. †Weekly capacities, net tons: 1951, 1,999,035; 1st half 1950, 1,906,268; 2nd half 1950, 1,928,721.

INDUSTRY

Freight Car Loadings (unit—1000 cars)	835†	839	813	852
Business Failures (Dun & Bradstreet, number)	160	130	171	143
Currency in Circulation (in millions of dollars)‡	\$28,034	\$27,932	\$27,842	\$27,042
Department Store Sales (changes from like wk. a yr. ago)‡	-3%	-4%	-21%	+14%

†Preliminary. ‡Federal Reserve Board.

TRADE

Bank Clearings (Dun & Bradstreet—millions)	\$13,938	\$15,210	\$14,657	\$16,132
Federal Gross Debt (billions)	\$256.6	\$256.4	\$255.6	\$257.8
Bond Volume, NYSE (millions)	\$10.9	\$10.1	\$11.3	\$11.8
Stocks Sales, NYSE (thousands of shares)	7,357	6,103	8,538	6,698
Loans and Investments (billions)†	\$70.3	\$70.3	\$70.1	\$68.2
United States Gov't. Obligations Held (millions)†	\$30,983	\$30,949	\$30,949	\$34,894

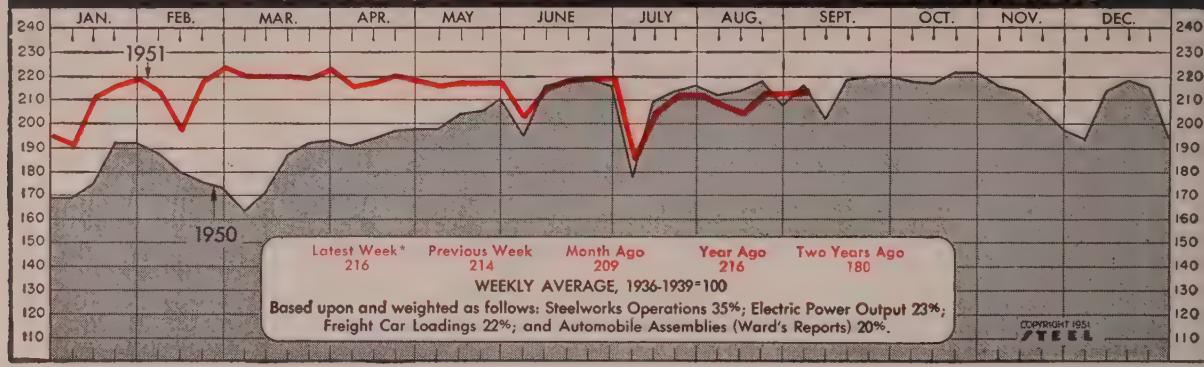
†Member banks, Federal Reserve System.

FINANCE

STEEL's Weighted Finished Steel Price Index††	171.92	171.92	171.92	156.99
STEEL's Nonferrous Metal Price Index‡	224.6	224.6	225.1	205.2
All Commodities†	176.7	176.7	177.6	167.8
Metals and Metal Products‡	188.2	188.1	188.2	174.8

†Bureau of Labor Statistics Index, 1926=100. †1936-1939=100. ††1935-1939=100.

STEEL'S INDUSTRIAL PRODUCTION INDEX



since World War II ended, if allowance is made for summer job seekers. The civilian labor force of 64,208,000 in August was below the previous month and also below August, 1950—presumably because of increases in the armed forces. Migrations of farm hands to industrial plants continued on a noticeable scale in August. Factory employment rose about 324,000, while agricultural employment dropped about 220,000.

Buyers Pessimistic ...

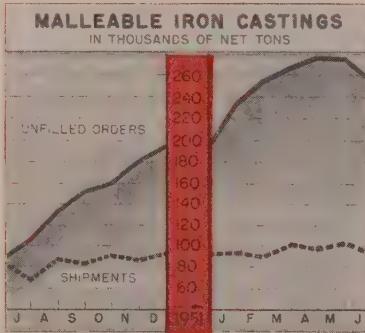
The summer production decline was sharper than anticipated, but still does not match the drop-off in new

orders. That's the word from the Business Survey Committee of the National Association of Purchasing Agents. Their survey of members showed that backlogs of orders have been on a steady decline for six months. Normally, the expectation of a brisk pickup in fall business would find August inventories on the rise, with lengthening forward commitments, according to the analysis. Neither of these are in evidence in this survey; inventory and materials controls may be partly responsible. Buyers believe many price increases are being held back by lack of demand and keen competition for available business. However, they warned

that any sharp increase in civilian and defense demand in the fourth quarter could create a wild scramble for materials.

Manufacturers' Orders Drop ...

New orders placed with manufacturers in July fell off 10 per cent from June, largely because retailers weren't selling as much of the goods they already had on hand, the Department of Commerce reports. A cheering note was seen, though: Total new orders of \$20.7 million topped deliveries of \$19.8 million that month, causing a further rise in factory backlog of unfilled orders to



Malleable Iron Castings

Thousands of Net Tons

	Shipments		Unfilled Orders*	
	1951	1950	1951	1950
Jan.	92.5	62.9	234	62
Feb.	89.0	60.4	255	67
Mar.	101.7	66.3	267	70
Apr.	97.3	69.8	276	76
May	100.8	76.2	275	77
June	93.7	82.3	256	87
July	67.5	...	105	
Aug.	86.0	...	132	
Sept.	82.5	...	153	
Oct.	90.0	...	160	
Nov.	85.2	...	180	
Dec.	91.5	...	195	
Total	...	920.6	...	

* For Sale. U. S. Bureau of the Census.

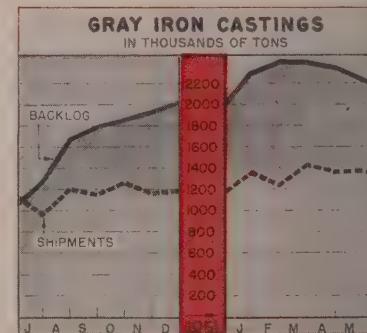


Steel Castings

Thousands of Net Tons

	Shipments		Unfilled Orders*	
	1951	1950	1951	1950
Jan.	174.1	89.1	675.4	142.5
Feb.	164.0	91.8	707.4	165.2
Mar.	190.7	111.8	779.7	185.6
Apr.	181.9	107.0	846.9	201.6
May	189.2	117.9	881.7	198.0
June	184.7	131.1	895.1	206.8
July	...	98.3	...	255.4
Aug.	...	128.4	...	239.9
Sept.	...	134.6	...	428.0
Oct.	...	149.6	...	521.8
Nov.	...	145.9	...	537.7
Dec.	...	155.3	...	554.2

* For Sale. U. S. Bureau of the Census.



Gray Iron Castings

Thousands of Net Tons

	Shipments		Backlogs*	
	1951	1950	1951	1950
Jan.	1,364	913	2,298	914
Feb.	1,234	864	2,392	873
Mar.	1,440	996	2,390	922
Apr.	1,363	981	2,337	922
May	1,396	1,095	2,229	978
June	1,309	1,136	2,162	1,040
July	...	961	...	1,287
Aug.	...	1,202	...	1,670
Sept.	...	1,159	...	1,794
Oct.	...	1,255	...	1,840
Nov.	...	1,161	...	1,930
Dec.	...	1,182	...	2,012
Total	...	...	12,905	

* For Sale. U. S. Bureau of the Census.

Charts—Copyright 1951, STEEL

55.4 billion. Factory inventories went up \$500 million in July, reaching a total of \$40.5 billion. The increase was only about half as large as in other recent months.

Laundrymen Sing the Blues...

Caught in the mires of materials limitations and consumer resistance, makers of home laundry equipment have good reason to sing the blues. Factory sales of household washers in July amounted to 139,779 units, less than half the July, 1950 figure, and down 45 per cent from June. Automatic dryers sales dropped off 34 per cent from the month before, but were 11 per cent above the same month of 1950. Ironers sold in July aggregated 11,100 units, off 55 per cent from June sales and about the same amount under sales of a year ago.

Plant Awards Double 1950's...

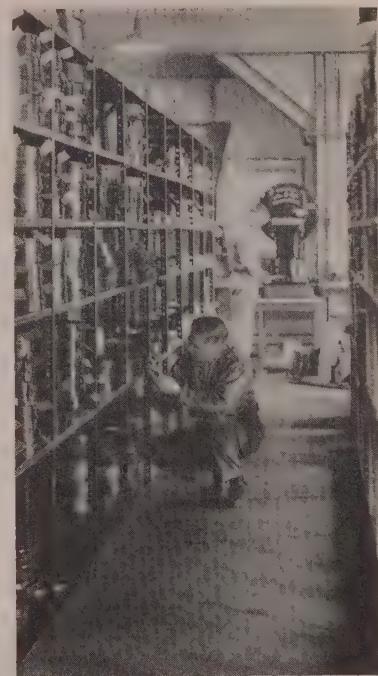
Industrial building awards at \$85.2 million topped the list of construction contracts in the week ended Aug. 30, says *Engineering News-Record*.

With a 35-week cumulative total of \$2,876,000,000, industrial construction is now 217 per cent above the mark set in the same period last year.

Trends Fore and Aft...

The electric power industry should see a further earnings decline this quarter, despite record-breaking power output. . . Work stoppages beginning in July totaled 425, the highest recorded this year. Total strikes in effect numbered 600 and caused a loss of 1,750,000 man-days in the establishments directly affected. . . Between 900,000 and 1,150,000 new television sets were in the hands of retailers at the beginning of August. Home radios at that time numbered close to 2 million. . . Consumer installment credit outstanding declined slightly in July, after showing small increases in the two preceding months. . . Industrial furnace business for July amounted to \$5,507,754. . . New business incorporations in July numbered 6,386, lowest total since last November.

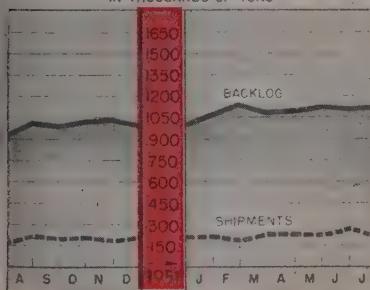
IS spring steel up your alley?



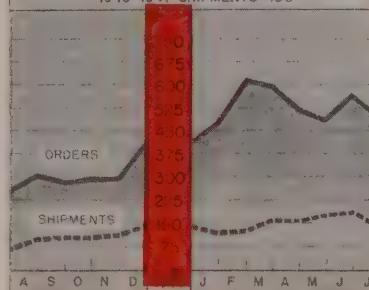
Issue Dates of other FACTS and FIGURES Published by STEEL:

Construction	Aug. 27	Gear Sales	Aug. 6	Ranges, Gas	Sept. 3
Durable Goods	Aug. 6	Indus. Production	July 23	Refrigerators	Aug. 6
Employ., Metalwk.	July 16	Ironers	Aug. 20	Steel Forgings	Aug. 20
Employ., Steel	Aug. 27	Prices	Aug. 27	Steel Shipments	Aug. 27
Foundry Equip.	Sept. 3	Pumps, New Orders	July 9	Vacuum Cleaners	Sept. 3
Freight Cars	Aug. 20	Purchasing Power	Sept. 3	Wages, Metalwkg.	Aug. 13
Furnaces, Indus.	Aug. 13	Radio, TV	Aug. 20	Washers	Aug. 20
Furnaces, W. Air	July 30	Ranges, Elec.	Aug. 27	Water Heaters	Sept. 3

FABRICATED STRUCTURAL STEEL IN THOUSANDS OF TONS



MACHINE TOOL INDEXES 1945-1947 SHIPMENTS = 100



Fabricated Structural Steel

Thousands of Net Tons

	Shipments		Backlog	
	1951	1950	1951	1950
Jan.	214.0	154.7	1,067	756
Feb.	193.6	149.8	1,143	780
Mar.	237.1	185.2	1,088	762
Apr.	234.1	187.8	1,093	727
May	234.5	194.8	1,121	785
June	257.1	202.4	1,111	781
July	202.4	165.5	1,135	920
Aug.	218.4	178.0	1,009	920
Sept.	198.7	178.0	993	920
Oct.	211.8	183.8	1,018	920
Nov.	193.8	183.8	1,034	920
Dec.	212.9	183.8	1,007	920
Total	2,275.9	1,754.7	10,607	7,560

American Institute of Steel Construction

Machine Tool Indexes

	New Orders		Shipments	
	1951	1950	1951	1950
Jan.	475.4	99.7	114.3	52.8
Feb.	615.5	89.2	123.8	56.1
Mar.	590.3	107.4	158.9	75.3
Apr.	516.1	98.9	157.7	61.6
May	483.0	116.4	175.1	82.5
June	558.8	124.1	182.8	91.9
July	490.6	253.1	145.0	68.3
Aug.	305.1	100.0	95.7	50.0
Sept.	280.6	100.0	101.6	50.0
Oct.	289.6	100.0	100.9	50.0
Nov.	291.9	100.0	110.9	50.0
Dec.	410.1	100.0	135.7	50.0

National Machine Tool Builders' Assn.

...OURS TOO

Pictured is just one of the aisles in Kenilworth's specialized spring steel stock department; here you see a portion of the wide variety of types, sizes and finishes (annealed or tempered) always on hand. Whatever your requirements, however small, Kenilworth can handle your orders quickly. You are assured of uniform end results plus Kenilworth's accurate meeting of specifications in shipment after shipment. Your inquiries are invited.

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Thomas A Edison Cuts Costs in Half with SPEED NUTS®

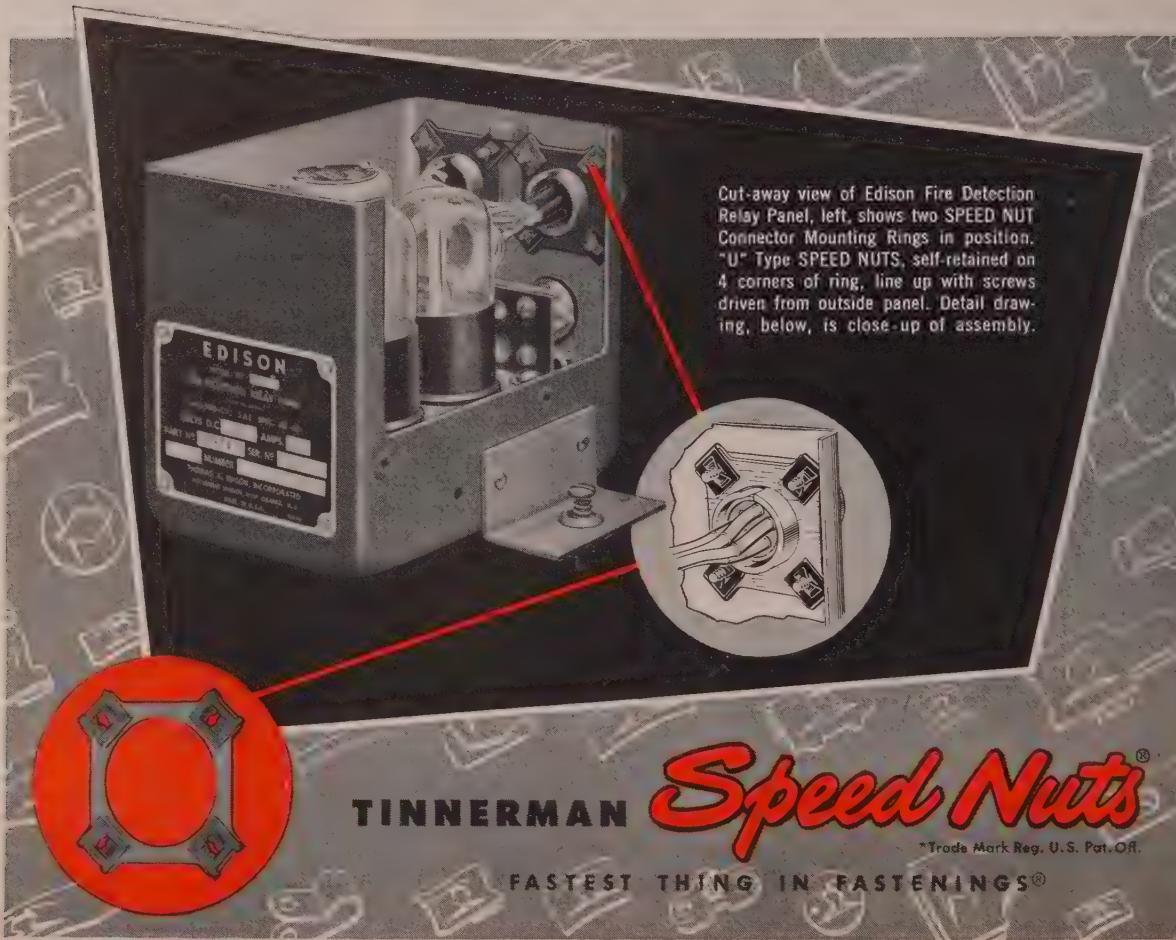
Edison specifies SPEED NUTS after cost comparisons reveal 50% savings over other militarily acceptable fastening methods.

In the very earliest design stages of their aircraft fire detection relay panel, engineers of Thomas A. Edison, Incorporated, checked various methods of attaching connectors to the panel.

Their requirements were rigid. The fastening means had to be light in weight, resist vibration loosening, provide quick and easy assembly, and be in line on cost. Tinnerman Aircraft Connector Mounting Rings proved to be the only fastener

that qualified on all counts. Connectors are quickly inserted through these mounting rings and the panel.

As for cost, Tinnerman SPEED NUTS turned in the finest record by far! Easily 50% assembly savings over acceptable military substitute fasteners were provided by faster, easier, better SPEED NUTS. Complex or simple, solving fastening problems is Tinnerman's specialty. New booklet, "A Story of Quality", reveals how we can help you. Write for your copy. TINNERMAN PRODUCTS, INC., Dept. 12, Box 6688, Cleveland 1, Ohio. In Canada: Dominion Fasteners Ltd., Hamilton. In Great Britain: Simmonds Aerocessories, Ltd., Treforest, Wales.



Men of Industry



MYRON H. EICHENGREEN
... a V. P. of Block Steel



ALFRED E. TREEN
... Houston purchasing mgr., A. O. Smith



W. S. ACUFF JR.
... Reynolds sales mgr., indus. goods

Myron H. Eichengreen was elected a vice president of **Block Steel Corp.**, Forest Park, Ill. He has been with **Inland Steel Co.** for 20 years, the last six of which he served as assistant to the manager of the sheet and strip division.

Cro-Plate Co. Inc., Hartford, Conn., elected **Alan W. Brown** as president to succeed the late **Theodore L. Brantly Jr.** **Robert C. Allen**, previously treasurer, was elected executive vice president and treasurer. Mr. Brown is the co-founder of Cro-Plate and as executive vice president was in charge of manufacturing and engineering operations.

Jack J. Jarms has joined **C. B. Herrick Co.**, Cleveland, as assistant sales manager. For the last five years he served **Thompson Products Inc.** as welding engineer in its jet division, and prior to that headed up welding sales and service for **Williams & Co.** in the Cleveland and Toledo, O., territory.

H. F. Roberts was appointed purchasing agent of the electrical, chassis, trim and paint department of **Lincoln-Mercury Division**, Ford Motor Co., Detroit. He returns to the division organization from its gas turbine plant, where he was purchasing agent, and fills the vacancy created by **C. S. Brown's** promotion to general purchasing agent. Mr. Roberts is succeeded at the gas turbine plant by **E. P. Byington**.

Charles E. Pritchard was appointed superintendent of all finishing mills for **Alan Wood Steel Co.**, Conshohocken, Pa. He was formerly associated with **Republic Steel Corp.**

Alfred E. Treen was appointed manager of personnel and purchasing at the Houston Works of **A. O. Smith Corp.** to succeed **F. B. Dunn**, resigned. Mr. Treen has been with the personnel administration staff since 1946.

John A. Hagan was appointed general superintendent of the Homestead, Pa., district works, **United States Steel Co.** He succeeds **H. G. McIlvried**, who retires after more than 50 years' service with the company. Mr. Hagan was assistant general superintendent at the Youngstown district works.

H. G. Paxton was appointed national business management manager, **Nash Motors Division**, Nash-Kelvinator Corp., Detroit. He was assistant zone manager at Detroit.

J. L. Mohun was appointed division manager, industrial insulation sales, **Baldwin-Hill Co.**, Trenton, N. J. He will be located at the new sales office established by the company at 4101 San Jacinto St., Houston.

Changes in the personnel of the sales department of **American Steel & Wire Co.**, Cleveland, U. S. Steel subsidiary, include: **Thurman Haskell**, assigned to special duties on the staff of the area manager of sales, western district, and **H. C. Hoy**, named manager of sales, Denver, to succeed Mr. Haskell, who is now located at Chicago.

Delmer Q. Bowman was appointed manager of midcontinent operations of **Earle M. Jorgensen Co.**, and will direct operations in territory served by the Dallas and Houston plants. He is also a vice president of Jorgensen.

W. S. Acuff Jr. was appointed industrial products sales manager, building products division, **Reynolds Metals Co.**, Louisville. For the last three years he was regional sales manager for the division in the New York region. Prior to joining Reynolds in 1948 Mr. Acuff spent 21 years with **Keasby & Mattison Co.** as salesman, district manager and general sales manager. He is succeeded as New York regional sales manager by **James C. Wolfe**, formerly regional sales manager in that area for **Keasby & Mattison**.

Roger S. Ahlbrandt was elected treasurer of **Allegheny Ludlum Steel Corp.**, Pittsburgh. **Clark W. King**, executive vice president, has been serving also as treasurer. Mr. Ahlbrandt was manager of stainless steel bar sales.

J. W. Peterson was appointed general traffic manager, **Air Reduction Co. Inc.**, New York, succeeding **H. W. MacArthur**, retired.

Harold Weinstein, president of **Calumet Iron & Supply Co.**, East Chicago, Ind., was appointed chief scrap adviser to **Edward W. Greb**, acting director of the Salvage Division, **National Production Authority**, Washington.

Charles T. McKinnie was appointed assistant sales manager of **Pratt & Whitney Aircraft**, division of **United Aircraft Corp.**, East Hartford, Conn. He has been chief of western field engineering for **United Aircraft Service Corp.**, Los Angeles, and is succeeded there by **John Craig Jr.**

John W. Dunn was appointed assistant to the vice president of manu-

factoring at **Bell Aircraft Corp.**, Buffalo. He formerly was vice president and assistant general manager of Frederic Flader Inc.

Albert T. Harris was appointed assistant general manager of **Buffalo Arms Inc.** and will be in charge of operations of the new plant under construction in Akron, N. Y. He formerly was general manager of International Railway Car Co. plant in Kenton, O.

Richard E. McElvain was named to **Allis-Chalmers Mfg. Co.'s** Duluth branch office as a sales representative specializing in crushing and mining equipment.

T. S. Amato was appointed manager of the subcontracting division of **American Type Founders Inc.**, Elizabeth, N. J. He was general manager of its Waverly Division during World War II.

H. E. Schrader was appointed assistant to vice president, product development and research, of **Western Gears Works** plants in Lynwood and Belmont, Calif., and Seattle; **Pacific Gear & Tool Works**, San Francisco; and **South Western Gear Works**, Houston.

John F. Moriarty was appointed to the newly created position of sales promotion manager, replacement sales division, **Cleveland Graphite Bronze Co.**, Cleveland. He has been with B. F. Goodrich Chemical Co. in Cleveland in various advertising and public relations staff capacities.

J. Terry Summers has joined **Admiral Steel Corp.**, Chicago, as vice president. He formerly was assistant manager of specialty steels as a spring steel specialist at Lapham-Hickey Co.

Joseph Ralph was appointed sales manager, **Melrath Metal Stamping Corp.**, Red Hill, Pa.

Donald W. Sawyer was appointed parts sales manager for **Dearborn Motors Corp.**, Birmingham, Mich., to succeed **Leo F. King**, resigned to become president and general manager of King-Bond Inc., a Dearborn dealership in Richmond, Ind.

Harold L. Coons, advertising manager, **Keystone Steel & Wire Co.**, Peoria, Ill., was appointed special consultant on the agricultural program of the special heavy metal scrap salvage campaign of the Advertising Council.



BENJAMIN A. MAIN JR.
... V. P.-engineering, Aeroquip



H. L. SCHROCK JR.
... Aeroquip V. P.-treasurer

Aeroquip Corp., Jackson, Mich., elected as vice presidents **Benjamin A. Main Jr.** and **H. L. Schrock Jr.** Mr. Main, vice president in charge of engineering, has been with Aeroquip since 1942 as chief development engineer. Mr. Schrock, vice president and treasurer, has been with the company since 1947.

C. W. Bryant was appointed manager of the purchasing section of **General Electric Co.'s** materials and purchasing department, Schenectady, N. Y. **W. F. Rauber** was named special representative of the large apparatus division in Washington, and **Clarence Burke** succeeds him as manager of sales, switchgear department, in Philadelphia.

John B. Madden was appointed hydraulic sales manager for the north-central district of **A. O. Smith Corp.**, with offices at 310 S. Michigan Ave., Chicago. Former product supervisor, he originally operated hydraulic sales from the company's Houston works, where the firm's vertical turbine pump manufacturing is centered. **Hal Kern**,

former district pump sales manager, Chicago, will now concentrate on distributor accounts in the field.

Edgar C. Dehne was elected assistant treasurer and assistant secretary of **Westinghouse Electric Corp.**, Pittsburgh. He has been eastern district treasury manager of the corporation at New York, and now will make his headquarters in Pittsburgh. Mr. Dehne replaces **Edward George Jr.**, retired after more than 45 years with Westinghouse.

Sundberg-Ferar, Detroit, announces that **Clair A. Samhammer** has joined the firm as a designer. He was with **Creative Industries** of Detroit.

Rigidized Metals Corp., Buffalo, appointed **John Hayes** assistant advertising manager. He formerly was associated with the advertising department of **Trico Products Corp.**

Named to head the expanded sales department at **American Box Co.**, Cleveland, is **A. R. Caputo**, formerly assistant sales manager.

Rockwell Mfg. Co., Pittsburgh, appointed **Robert B. Kitzmiller** as manager of its San Francisco office to replace **Gilbert T. Bowman**, transferred to Pittsburgh headquarters as sales manager, gas products.

Midwest Piping & Supply Co. appointed **John E. Brock** director of research, with headquarters at the main plant and executive office in St. Louis.

W. H. Bolger was promoted to manager of laboratories, and **Cromwell Bowen** to assistant manager of laboratories, **Robert W. Hunt Co.**, Chicago.

Frederick L. Murray was promoted to assistant superintendent of foundries, **Hunt-Spiller Mfg. Corp.**, Boston, to succeed **William E. Mulcahy**, recently named superintendent.

Herman F. Zorn was appointed executive vice president of **Ferracute Machine Co.**, Bridgeton, N. J. He formerly was president and general manager, **V. & O. Press Co.**

Oliver Smalley, president, **Meehanite Metal Corp.**, with offices in New Rochelle, N. Y., was elected an honorary life member of the **Institute of British Foundrymen**, London.

Dr. G. Raymond Fitterer, head of the **University of Pittsburgh** department of metallurgical engineering since



CHARLES R. RITTER

... Luria Bros.' gen. traffic mgr.

1939, was appointed dean of the Schools of Engineering and Mines.

Charles R. Ritter was appointed general traffic manager of **Luria Bros. & Co. Inc.**, Philadelphia, dealer in iron and steel scrap. He is succeeded as traffic manager by **Edward J. Bolton**.

Joseph E. Edens was appointed a member of the sales department of **Lebanon Steel Foundry**, Lebanon, Pa.

Willard H. Jones, formerly supervisor of administrative and service departments at the Madison division, **Dow Chemical Co.**, Midland, Mich., was promoted to production and economic co-ordinator of the magnesium department. **Dow Chapin** was named to the magnesium sales group of the Cleveland office.



PAUL L. WRIGHT

... sales mgr. at Ryerson's Buffalo plant

Paul L. Wright was appointed sales manager of the Buffalo plant of **Joseph T. Ryerson & Son Inc.**, Chicago, steel distributor. He was office manager at Buffalo in which capacity he also served as supervisor of the company's inside sales department. He joined the company in 1939.

Harvey R. Cook was placed in charge of advertising and sales promotion by **Timken - Detroit Axle Co.**, Detroit, and its home heating equipment division, **Timken Silent Automatic**. **R. W. Smalley**, **A. E. Jones**, and **W. E. Featherstone** continue as assistants to the advertising manager.

M. A. Hanna Co., Cleveland, announces retirement of **Earl E. Hunner**. He served as general manager until 1946 when he became executive consultant.



WILLIAM ZWICKER

... heads Nat'l Steel & Shipbuilding div.

William Zwicker, head of the Los Angeles sales and engineering office, **National Steel & Shipbuilding Corp.**, San Diego, Calif., was named manager of the company's structural steel division. He succeeds the late **Otto Tatus**. Mr. Zwicker continues to supervise the Los Angeles office which he has headed since it was established in 1945.

William G. Harris was appointed personnel manager of **Pratt & Letchworth Co. Inc.**, Buffalo. He succeeds the late **Joseph Laffey**.

Edward L. Klopfer was appointed sales engineer, **Gross Machinery Co.**, Buffalo. He joined the firm last January.

George E. McLaughlin was named vice president, **Young Steel Products Co.**, Youngstown, a warehouse firm.

OBITUARIES...

Marion F. Crabtree, 73, open-hearth superintendent, cast armor division, **American Steel Foundries**, East Chicago, Ind., died Aug. 27. He joined American Steel Foundries in 1904 and served almost 40 years at the Granite City Works. When the cast armor division plant opened in 1942, he was transferred there.

Henry W. Crosby, chairman of the board of **Crosby Co.**, Buffalo, steel stamping concern, died Aug. 25.

Harry W. Renick, 63, vice president, **Ramapo Ajax and Brake Shoe & Castings Divisions** of American Brake Shoe Co., and in charge of their western sales operations, died Aug. 28 in Los Angeles.

Ray C. Newhouse, 76, who retired in 1945 as manager and chief engineer of the basic industries depart-

ment of **Allis-Chalmers Mfg. Co.**, Milwaukee, died Aug. 27. He had been retained by the company after retirement in a consulting capacity. Mr. Newhouse gained fame as an engineer, inventor and designer of some of the world's largest cement and mining machinery.

Sydney W. Kitson, 53, manager of the public works division of **Worthington Pump & Machinery Corp.**, Harrison, N. J., died Aug. 27.

Alton P. Hall, 51, former vice president and general manager of sales, **American Chain & Cable Co.**, New York, died Aug. 31.

William F. Hoffman, 75, who retired in 1946 as president and treasurer, **Industrial Wire Cloth Products Corp.**, Detroit, died Aug. 29.

W. DeWitt Tappan, inventor and consulting engineer, died Aug. 26. He

was associated for many years with **Caldwell Mfg. Co.** in Rochester, N. Y.

James D. Evans, 74, vice president, **Merchant & Evans Co.**, Philadelphia, heating-unit manufacturer, died Aug. 31 in Bryn Mawr, Pa.

C. T. Yates, 63, secretary-treasurer, **E. C. Brown Co.**, Rochester, N. Y., maker of spraying equipment, died Aug. 29.

Charles A. Muse, 84, retired official of **H. C. Frick Coal & Coke Co.**, United States Steel Corp., Pittsburgh, died Aug. 27.

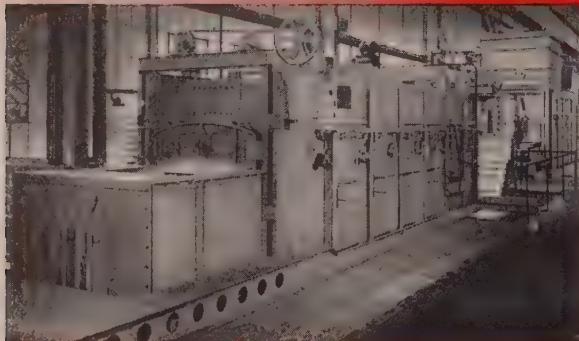
Clyde L. Savage, 57, vice president, **Du Page Boiler Works**, Naperville, Ill., died Aug. 26.

William H. Manning, 50, technical assistant to C. R. Osborn, vice president of **General Motors Corp.**, Detroit, died Aug. 24.

'SURFACE' *Direct-Fired* FURNACES

offer these outstanding advantages:

- ★ 60 Types of 'Surface' burners in 600 sizes...
- ★ Furnace designs proved in hundreds of installations mean...
- ★ Undivided 'Surface' responsibility from design to operation.



↑ HARDENING—Chain conveyor-type, direct-fired furnace for handling track shoes, sprockets and axles.



↑ ANNEALING—Roller hearth, direct-fired furnace for annealing brass bars, strip and coils.

STRESS RELIEVING—Direct-fired Car Bottom furnace for stress relieving welded pressure tank assemblies.



NORMALIZING & ANNEALING—Roller hearth, direct-fired furnaces for annealing rolled armor plate for tanks.



Combine superior furnace designs . . . quality refractories and alloys . . . proper selection of burner types . . . efficient application of the combustion system to meet the particular heating or heat treating application. That's what you get when

you select a 'Surface' direct-fired furnace.

Whenever you have a production problem involving heat treatment, write or call 'Surface'. Our industrial furnace sales engineers will be glad to discuss your problem with you.

'Surface' **INDUSTRIAL FURNACES**

SURFACE COMBUSTION CORPORATION • TOLEDO 1, OHIO

JETS ON THE MARCH—The British take a lot of credit for the advanced stage of their engineering progress on turbojet aircraft engines, and probably rightly so since their engineers, from Frank Whittle on down, have not had to freeze designs in the interests of mass production as has been the case in America. Nevertheless, U.S. jet experts have been moving ahead rapidly in the past six years, exchanging their design refinements and processing methods to the point where wonderment is heard here and there over why it has been necessary to assign British engines to production assignments in the current defense effort here. A look at what one leading builder in this country has accomplished may prove illuminating.

—p. 90

NOTES ON ALUMINUM BRAZING—Talk is heard around the motor industry of the copper shortage forcing a switch to brazed aluminum radiator assemblies, although it is difficult to believe the lack of red metal will be of such duration as to force so drastic a retooling. Aluminum can be brazed readily, if several critical factors are kept in mind. One is oxidation, which may be overcome by brazing alloys with fluxing qualities preventing oxidation. Another is weakness of the metal at high temperatures, this being licked by brazing materials which melt at temperatures as low as 400°F. Special aluminum "brazing" sheets also have been developed recently, with brazing material rolled into their surface, eliminating the necessity for applying any brazing metal in the joining operation.

TRACERS IN BLAST FURNACE—Radioactive cobalt-60 pellets, inserted at strategic points in the lining bricks of a British blast furnace, may give some interesting indications of refractory wear when experiments now under way are concluded and evaluated. As the lining wears away the intensity of the radioactive inserts lessens, measured by counters positioned outside the furnace wall.

—p. 102

BRASS POWDER FOR FUZES—Powder metal fabricating plants are producing rotor blanks for shell fuze boosters of brass powder at a rate of about 1000 per hour per set of tools. The part is the first brass ordnance element to involve powder metallurgy on any extensive scale and weighs only 0.8 ounce. It was made formerly from extruded 70-30 brass bar stock. Density of the compact is 7.7, against 8.53 for the solid bar; sintering temperature must be held closely in the 880-900° C range.

ZINC PLATE STANDS UP—In a test of automotive trim hardware plated with bright zinc, then given a special chromate-type conversion treatment and finally coated with baked clear lacquer (as an alternate for conventional copper-nickel-chrome), resistance to salt spray as high as 300 hours is reported before the first signs of corrosion products.

This compares with about 50 hours for the conventional chrome plate. Results consistently ran in excess of 100 hours on parts of both steel and zinc die castings. There is nothing new about this type of finish except its application to automobile trim. One objection heard to the "alternate" plating methods in which lacquer is the final coat is that the parts spot and tarnish quickly, even from drops of rain or the touch of fingers.

FLUORINE GOES COMMERCIAL—A new family of organic compounds known as fluorochemicals was delineated before the American Chemical Society in New York last week. Uses, present or foreseen, include flame extinguishers, lubricants withstanding high heat, coolants for electrical equipment, aids to electroplating, new resins, and as tools to separate and purify rare metals in atomic energy studies. Freon, Teflon, Genetron, and Kel-F are examples of the compounds. A newer one, perfluorocaprylic acid, lowers the surface tension of water to a remarkable degree, suggesting its use in electroplating solutions. Westinghouse has devised a system of cooling the innerworkings of big transformers by using a "jet spray" of liquid fluorocarbons to carry away the heat generated and thus boost power delivery by a reported 350 per cent.

STUFF UNDER WRAPS—A "barrier" material for military packaging, consisting of aluminum foil laminated to vinyl plastic film and polyethylene film and then to scrim cloth, is in great demand for Method II preservation of engines, electrical and radio equipment, instruments, propeller hubs, guns and the like; so much so, it is reported, that production facilities for the wrapping are booked solid far into the future.

—p. 98

FLASH HEATING SYSTEM—Delivering 500 heated forging billets an hour to each of two headers producing automotive hinge components is being accomplished by a gas-fired slot-type furnace with water cooled impingement burners located the full length of the 36-inch slot which has a cross-shaped section. A magazine feed and pusher keep the stock moving to the furnace and the heated slugs are delivered on a roller conveyor to the header operator in correct position for quick feeding into the dies.

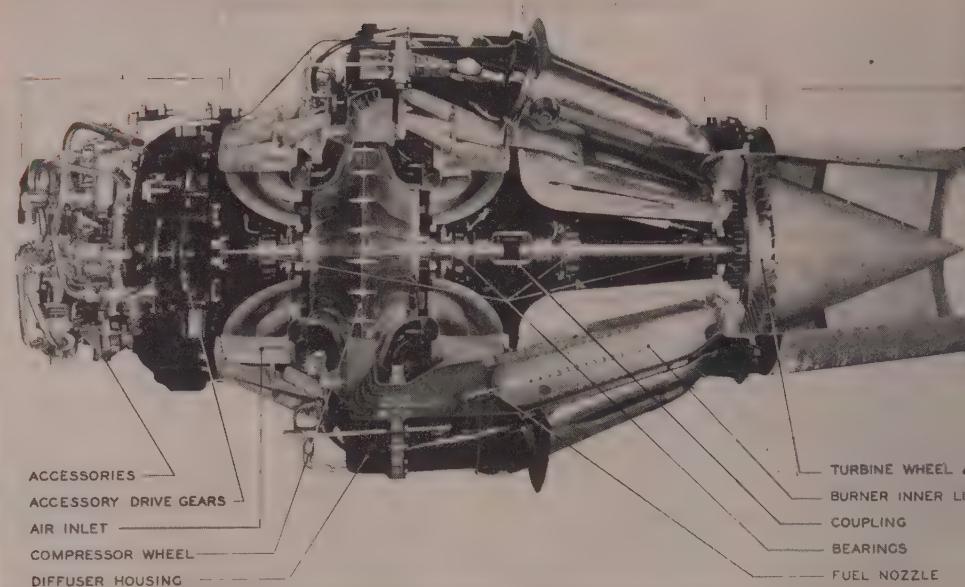
—p. 96

WHO DOES WHAT TO WHOM?—Some of the machinery boys were shaking their heads last week over a demonstration of European-built lathes, shapers and milling machines staged in Cleveland. Prospective buyers were promised immediate delivery from New York stocks, at prices 20 per cent under those for equivalent U.S. machines, and with no priority. The kicker was that the plants building the equipment had been financed by ECA funds!

—A.H.A.



ACCESSORY HOUSING COMPRESSOR SECTION COMBUSTION CHAMBERS TAIL CONE
TURBINE SECTION



Cutaway view of the centrifugal J33 turbojet engine in which air is supplied by a single forged aluminum impeller

Cultivating the Know-How of Jet

Concentration on design problems leads to improved processing methods and equipment. Result: More pounds of thrust and lower cost per pound, as the turbojets come of age

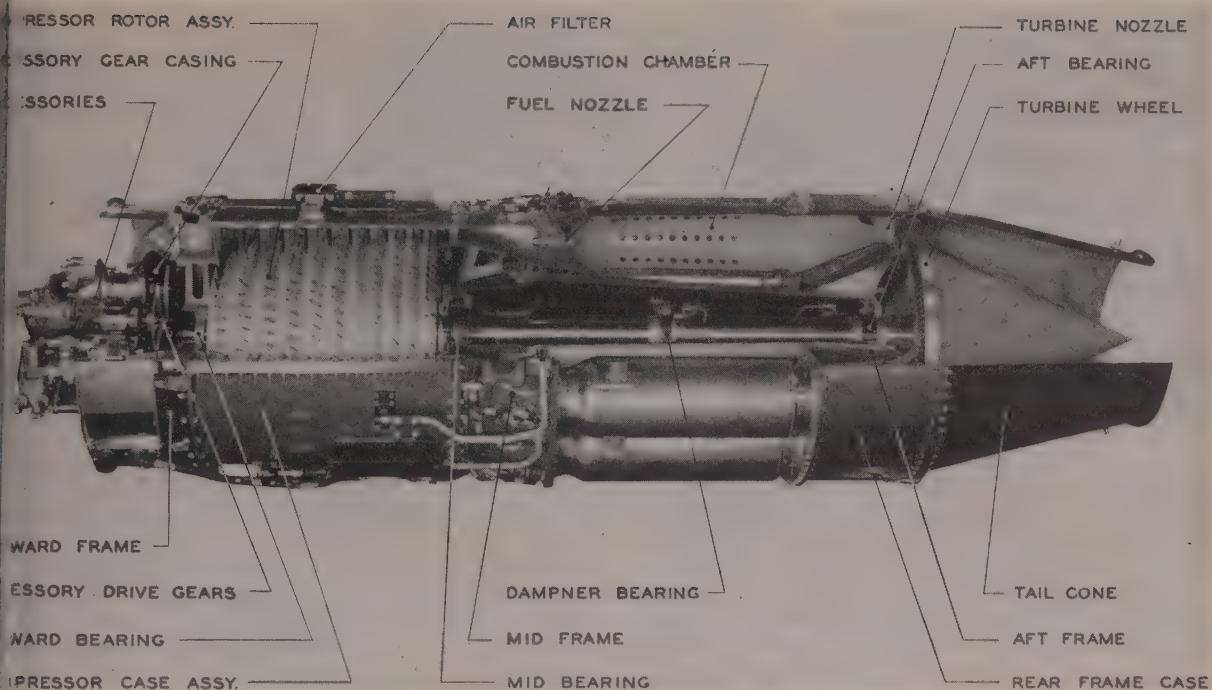
By A. H. ALLEN
Associate Editor

TURBOJET aircraft engine production, now in the throes of a terrific expansion, has called for a fairly complete upheaval in accepted methods and materials hitherto used in the manufacture of reciprocating internal combustion engines of the radial and in-line types. While the principal acceleration has come in the past 15 months, there has been a continuing program of improvement and refinement under way since the close of World War II. Nowhere has this been more concentrated than at the Allison Division of General Motors Corp. in Indianapolis which shortly will deliver its 12,000th turbojet since undertaking the first model in 1945.

Years' Experience—Allison is an old hand at engine building, dating back to 1917 when redesign of the Liberty engine was undertaken in the effort to boost its horsepower. GM acquired the company in 1928 and designers went to work on the idea of a liquid-cooled 1000-hp aircraft engine. This materialized in the form of the V-1710 engine, the first of

which were rated at 750 hp and were delivered to the Navy. Steady refinements were made until the 1000-hp goal was reached in 1937. The war saw a furious production and plant expansion race underway, the result being that by V-J day, output had reached 70,000. The V-1710 and the twin design, V-3420, are now ancient history. Even spare parts bins have been cleared out to make way for the turbojets.

As to physical stature, Allison had 600 employees in 1938, burgeoning to 23,000 in 1944. Plants were expanded to seven in number, covering over 4.5 million square feet. Largest is in No. 5 in Maywood, with 2 million square feet, where turbojet engine manufacture is being centered. Current employment is better than 14,000, will approach 18,000 by year-end. The division has a number of important production assignments in addition to engines—transmissions for the M-46 General Patton and T-41 Walker Bulldog tanks; precision sleeve-type bearings for aircraft engines, locomotives and machine tools; parts for diesel



Smaller in diameter than the centrifugal engine is the axial flow J35 unit, with 11 stages of compression and eight horizontal combustion chambers

Engine Manufacture



locomotives, and heavy-duty automatic transmissions for trucks, off-the-road equipment and oil field use.

Two Engine Types—Two distinct types of turbojet engines are being built in quantity, a fact unique among U. S. manufacturers of this equipment. They are the centrifugal and axial flow designs, referring to the type of compression system used to pump air to the combustion chambers. The first has a single compressor wheel or impeller while the second has multiple stages of air compression. Cutaway illustrations of both types show the overall construction.

The centrifugal design was the first to be built

This is the T40 turboprop power unit, comprising twin axial flow engines driving contrarotating propellers. Only a third of the turbojet power is realized at the propeller

by Allison and is known as the J33 model. It has gone through many stages of modification for Air Force installations, starting with the J35-A-1 and going on up, by odd numbers only, to the latest type, the J33-A-33. Models furnished the Navy are given even-number designations, such as J33-A-16. The various types do not necessarily go into production in succession, the number being assigned early in the development period and carried on through qualifying tests. Some never may see actual production, depending upon what happens during testing and upon the speed with which design changes can be assimilated.

Ten Models—The axial flow compressor engine is called the J35 and has already been built in ten models, the A-1, 3, 5, 9, 11, 13, 17, 19, 21 and 29. An A-23 model, underway since 1949, is still in the





prototype stage, and incorporates many unusual features differentiating it from other J35s and giving rise to its name Superjet. Four of them will be installed in the Air Force's YB-47C Boeing "Stratojet" bomber, delivering more thrust than the six jets now in the B-47. (Turbojets are rated in pounds of thrust, not horsepower, with one pound thrust being roughly equivalent to one horsepower at 375 mph.)

The J35-A-23 features 16 axial stages of compression with a three-stage turbine, previous J35s having 11 compression and single turbine stages. Requiring no external oil supply, it has its own complete system, as well as an integral hydraulic system to operate variable-area jet nozzles and the air inlet screens. Further, it incorporates deicing features on the air inlet vanes and the bullet nose in the air intake, heat for deicing being bled from the compressor. Air inlet screens are automatically retractable and closeoff doors are positioned in the air inlets. The "cannular" combustion section has a single-can outer combustion chamber similar to an annular type burner section, but with ten individual cans inside the outer one. Compressed air flows from the outer can into the inner liners for combustion. This unusual construc-

Closeup of the axial flow compressor showing the 11 stages or wheels and the vanes in the casing. Clearance is only 0.060-0.070-inch

Heavy equipment is required to flash weld the turbine wheel to the shaft, both high-alloy steel and the heart of the turbojet engine

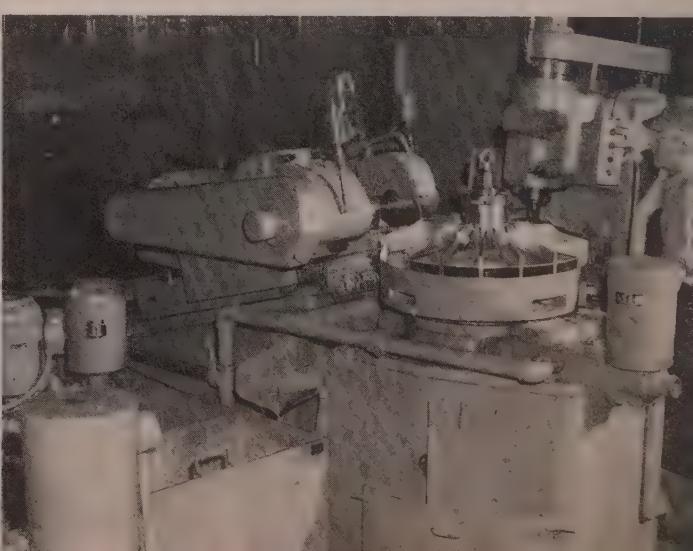
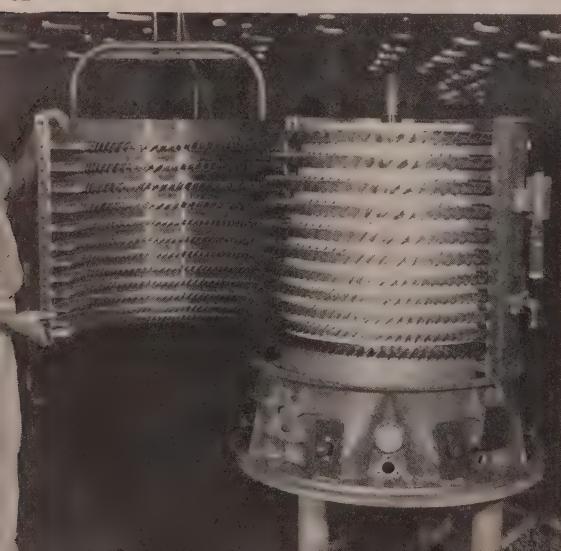
tion is said to improve structural strength and contribute to ease of assembly, as well as permitting inner cans to be replaced easily in the field.

Centrifugal vs. Axial Flow—Principal differences between the centrifugal and axial flow engines are these: Small diameter of the axial flow design means less frontal area and consequently less drag in flight. Higher air pressures developed in this type of compressor are figured to increase thrust and bring a 10-15 per cent improvement in economy over the centrifugal compressor—an important gain since the jet engine is a notorious fuel hog. On the other hand, estimates indicate 50 per cent more man-hours are required to build this type of unit, making its cost appreciably higher per pound of takeoff thrust in comparison with the centrifugal compressor engine (without afterburner).

Incidentally, cost checks show that from 1947 to 1950, a reduction of 70 per cent in dollars cost per pound of thrust has been made by engineering and manufacturing attack, in spite of generally rising costs.

Navy Turboprop—Along with the expanded pro-

Specially developed automatic milling machine for hogging out the aluminum impeller for the centrifugal engine. Part is indexed one blade at a time as the two heads advance, cut and retract



duction of the straight turbojets and afterburner models, Allison is currently preparing for production this fall another "first" in military engines in this country—a turboprop engine for the Navy. The turboprop absorbs the major portion of the available power in the turbine wheel component and through gearing drives a propeller.

With guaranteed static rating of 5500 horsepower and weight of 2500 pounds, it has twin power sections connected by extension shafts to a reduction gear driving contrarotating propellers as shown in an illustration. Each power section drives both propellers and for cruising single power sections can be de-clutched to save fuel. The design is claimed to be the first turboprop engine in the country to complete a 50-hour flight clearance test and the first to power U. S. aircraft without the assistance of reciprocating power plants.

3200 Suppliers—Some statistics on subcontracting for Allison turbojet engine work are interesting. Supplier list totals 3200, of which 500 are in the productive material classification. Of the full list, covering 29 states, 1800 employ less than 500 persons. For all defense production, Allison buys 88 per cent of its parts, makes the balance in its own plants. In the case of the centrifugal type turbojet engine specifically, all parts are manufactured at Allison except turbine buckets, sheet metal elements such as combustion chambers, liners, tail cones, afterburners, etc., and the various engine accessories.

No engine builder can boast more flying hours on its jet engines. The J33, rated at 5400 pounds thrust with water injection at takeoff in its latest A-23 type, and the J35, rated at 5600 pounds in the A-29 model, together with the thousands of earlier versions which have been installed in half a dozen different fighter planes, have accumulated over 1,000,000 hours of actual flight time. Some of the J33 engines are

Sonic testing a cast light metal midframe for the J33 engine to locate internal discontinuities or non-homogeneity. Equipment is the Reflectoscope



now reporting over 700 hours of service before over-haul, a figure that would have been called fantastic only a few years ago. Consider that the shaft speed of this engine is 11,750 rpm. The J35 is somewhat slower, about 8000 rpm.

New Design, New Methods—In the past five years there have been notable strides in the collective know-how of turbojet engine design and construction, all contributing to improved performance, reliability, durability and economy. Strong emphasis is placed on the design factor, Allison for example now having an engineering department numbering 1900, the largest of any General Motors division.

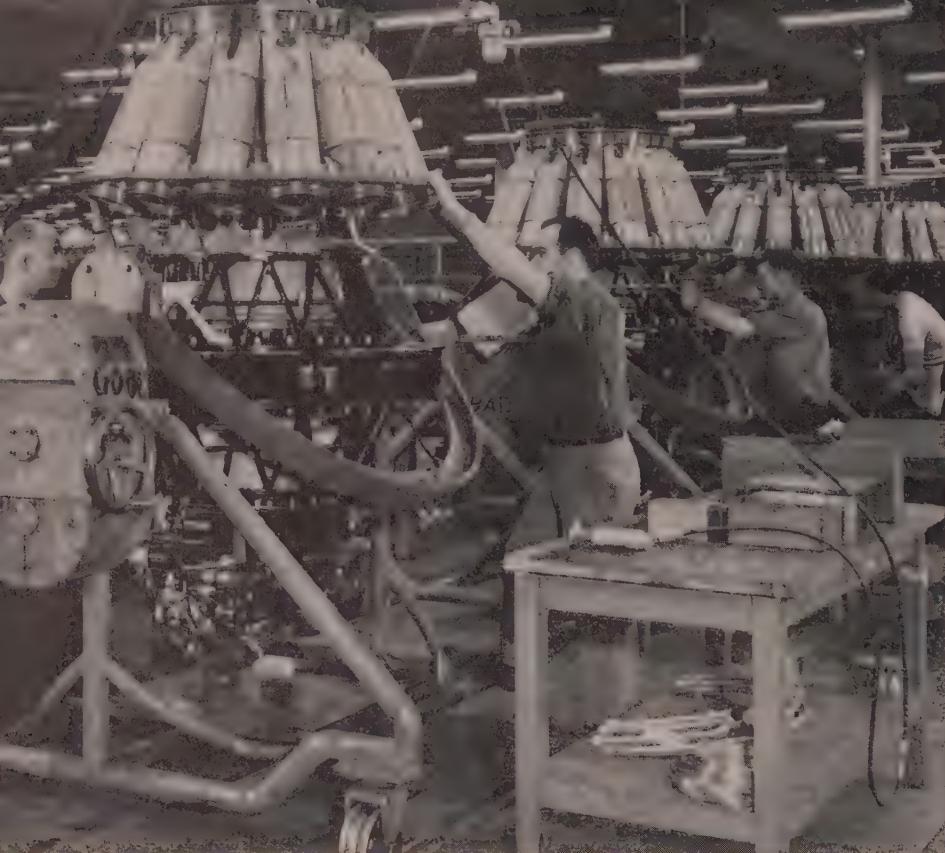
New designs inevitably lead to new processing techniques. Some of these methods are developed locally, but in many cases they are worked out in co-operation with the parts suppliers.

Primary metals of the turbojet are stainless and other high alloy steels, magnesium and aluminum. A typical J33 requires 3030 pounds of manufacturing material; a J35 3083 pounds. Of these gross weights approximately 80 per cent is recovered in the form of finished components. Breakdown between the three principal metals used is restricted information for some reason, but a guess might be 50 per cent steel, 30 aluminum and 20 magnesium.

Engine "Hot Section"—The turbine wheel is really the heart of the engine, for it is here that the blasts from the combustion chambers are translated into rotational power to drive the compressor, and it is here that the attack of flame and gas on metals is the sharpest. Striking advances have been made in design and materials for this element of the engine's "hot section." Precision forged turbine buckets of tough super-alloy now are produced at far less cost than a few years ago. Recovery of 50 per cent of the original bar stock is possible, against a measly 27 per cent when they were first made. Dimensional control is all-important, tolerances being as little as 0.0001-inch. Finishing techniques include automatic honing of leading and trailing edges, vapor blasting for surface smoothness, and crush grinding of dovetails (ends that fit into slots in the wheel disk).

For the hot end turbine buckets forgings are at present used and, undoubtedly, will continue to be until some of the cast materials and casting and inspection processes are developed to a point where "maverick cast" buckets are eliminated. There are several cast alloys that appear potentially excellent bucket materials.

Composite Wheel and Shaft—Allison uses a composite turbine wheel and shaft, flash welded together. The wheel or disk is unusual in that it is forged from a 9-inch round ingot or billet prepared by the Kellogg process. This involves the forming of SAE 1020 steel strip into tube shape, inserting it into a copper mold, pouring the required amounts of ferroalloys into the center through metering plates and arc melting. Steel is Timken alloy 16-25-51 (chrome-nickel-iron) and by the process it can be produced to close analysis and high purity, resulting in a material with high strength and relatively high ductility. Each ingot makes a



Left—Line production of J33 turbojets is exemplified here as the 14-can combustion chamber unit is lowered onto the frame assembly

Engines are shipped in these heavy-gage steel "bathtubs", sealed and pressurized so they will float if dunked. The containers cost several thousand dollars.



single wheel disk, the ingot weighing 310 pounds, the rough forging 250 pounds and the machined wheel 186 pounds.

Just ahead of the turbine wheel is the nozzle diaphragm, a ring fitted with closely spaced vanes which direct the path of the 1200-1300° F gases coming from the combustion chambers into the turbine buckets at the angle for most efficient power delivery. Vanes in this diaphragm take an even hotter blast than the turbine buckets and, of course, are stationary. They are made in several types, both as to alloy and methods of manufacture. Precision investment castings and parts made by the Prym process extrusion method employing alloys of superior oxidation and corrosion resistance are used.

Close Tolerances—In compressor sections the problem of heat is not critical but the units are nonetheless demanding insofar as precision machining is concerned, particularly in the axial design where multiple stages are involved. Each succeeding stage has blades of slightly shorter length as the air pressure builds up toward the delivery end. Wheels at the forward end are machined aluminum alloy forgings into which blades are dovetailed. Ring spacers separate the different stages, with the wheels splined to the central shaft. At the hot end of the compressor, where air temperature increases to 400-500° F, the compressor wheels are changed to stainless steel.

Extreme precision must be maintained in machining and fitting these wheels and their blades, since clearance between the blades and the vanes in the compressor casing is only 0.060-0.070-inch. Further, design must be such that blade replacement is not too difficult. Since outside air is being sucked in and built up to high pressure, any foreign particles such as stones or bits of metal which are trapped in the air stream may easily damage or break a compressor blade and there are 1100-1500 blades in an axial flow compressor.

Some of the compressor blades are forgings. Others may be of the powdered metal type—powdered iron compacted in a die, sintered and infiltrated with copper, and finally chrome plated. A typical compressor may have as many as 600 of them.

Allison Firsts—Allison is rightly proud of the contributions its engineers have made to better and less costly turbojet engines. They have advanced numer-

ous ideas for more economical forging of buckets; developed the design and production of compressor vanes free from critical materials; worked out machining procedures which boosted metal recovery on gear forgings to 40 per cent; devised cutting speeds, feeds and angles which raised production on broaching turbine wheels from 5 to 20 per broach. Allison also claims to be the first to use ultrasonic testing for accurately locating both structural discontinuities and nonhomogeneity in magnesium, aluminum and steel parts such as impellers, turbine wheels, frame sections and shafting.

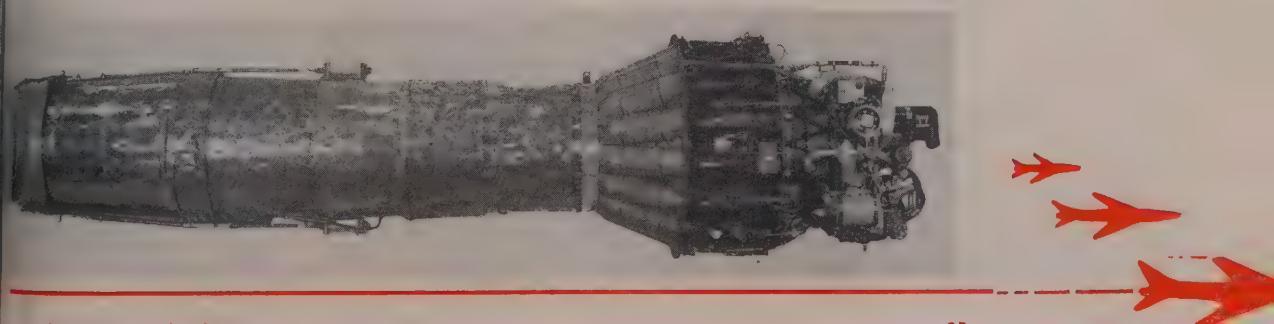
In early engines combustion chamber liners were good for about five hours. By effective redesign principally, liner life has increased to some 700 hours. Knowledge of how to weld the thin-gage stainless steel sheet used in these liners, "burner cans" tail cones, steel midframes and other strange sounding parts was practically nonexistent six years ago. Now procedures have become routine.

More Thrust—One of the latest improvements to be incorporated in the engine design is the afterburner, a cylindrical extension to the rear in which are positioned additional fuel nozzles, igniters and suitable internal deflecting rings or baffles to prevent the outward rushing gases from converging as they are enriched with fresh fuel and ignited. The afterburner provides about one third additional thrust, although it does mean literally pouring on more fuel.

The present day turbojet is loaded down with accessories, the idea being to make its functioning as nearly automatic, independent of pilot control, as possible. What is wanted is a single control lever for the pilot with all engine operating details interconnected with it. Some of the more important accessories are fuel pumps—gear type for the main nozzles, centrifugal for the afterburner, fuel controls governing on a speed-density basis, pressure switches to actuate emergency fuel pumps, starter-generator system geared to the compressor (cranking speed is about 1500 rpm), oil pumps for both compressor and turbine ends, controls for afterburner "eyelids", and an electrical system for energizing igniter plugs.

Which way now? Well the design road still beckons. More pounds of thrust per pound of weight and less pounds of fuel per pound of thrust . . . turbine wheels, nozzle diaphragms and combustion chamber liners that will stand another 100 degrees of heat . . . fewer piece parts and fewer total parts . . . easier assembly and disassembly. Allison engineers are working almost around the clock on turbojets for 1953 and 1954. They may already have reached new goals only waiting proof on the test stand.

Late model of the J33 engine, with afterburner as it appears ready for a model test. Note control arms regulating "eyebrows" on the end of the afterburner. Wrapping is a special material used to absorb heat in a test stand run



HIGH-SPEED HEATING

Expedites Hinge Production

Using slot-type billet heaters fed from magazines, Dodge forge plant upsets ends on flat blanks at the rate of 1000 per hour with two headers. Partly automatic setup speeds handling

Left—Door hinge forgings, right to left, blanks, upset forging before flash is sheared off and after flash removal

Below—Setup for upsetting and trimming hinge components in the Dodge forge plant. Billets with one end heated are delivered by roller conveyor, right. After forging and trimming they drop down a chute onto the chain conveyor, part of which appears at the lower right hand corner

DOOR hinges for Chrysler, DeSoto, Dodge and Plymouth passenger cars are made from blanks of flat stock ranging in size from $1\frac{3}{4} \times \frac{3}{8}$ -inch up to $2 \times 7/16$ -inch. One end of each blank or billet has to be upset. Forging of these hinge components is done in the company's Dodge forge plant, Detroit. Upsetting is effected in a single blow on a $1\frac{1}{2}$ -inch hot header. Heading produces a flash which is trimmed off in the second blow using, in the second position, high speed steel dies that do not require water cooling.

4000 per Shift—As heading and trimming of this type are simple and very rapid operations in which about 4000 forgings are produced per header in an

Loading billets taken from the hopper at left into the magazine of one of two high-speed heaters at each side of the man who keeps the magazines stacked with billets



AND FORGING

By HERBERT CHASE

8-hour shift, the chief problem is to deliver heated billets to the headers (of which two are used) at a sufficiently rapid rate to keep the headers operating at or near capacity. This is accomplished by providing two-high-speed slot-type billet heaters.

Each heater has a balanced type proportional mixer for gas and air that is fed into manifolds and issues from a set of opposed burners equally spaced along the heating zone. The slot has a cross shaped section. Impingement type burners are located the full length of the slots. These burners feed the burning mixture against both sides of the billets whose ends project through one lower slot to a point slightly beyond the center of the cross.

Products of combustion issue from the fourth opening of the slot and enter the flue. All burners are water cooled. Walls of the slot are refractory, the refractory being held in place by fabricated steel shapes. The heating zone is only 36 inches long; billets are fed longitudinally through the slot at such a rate that their upper ends are heated to forging temperature by the time they reach the end of the slot and fall onto the short inclined roller conveyor to the header.

Automatic Delivery—Each heated billet strikes a

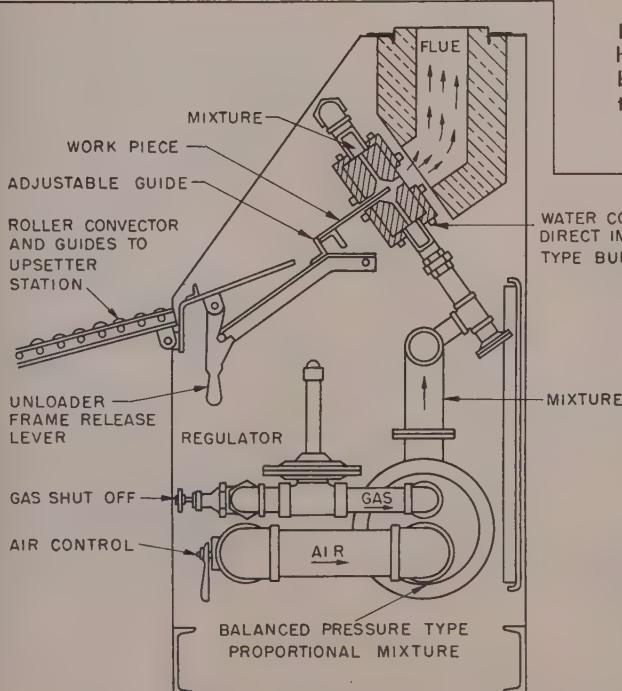
deflector at the end of the roller conveyor and comes to rest with the hot end away from the header operator. It is then in convenient position for him to pick it up with tongs, head and trim it and drop it into a chute. The forging then slides onto a short elevating chain conveyor that deposits the forgings in a tote box. Flash trimmed off drops into another container. By the time the operator of the header completes one forging, another is automatically delivered to pick-up position.

To feed 500 billets an hour to each of two headers would be practically impossible without excessive labor if automatic feeding means were not provided. Each heater is therefore equipped with a magazine and a pusher timed to feed one billet at a time onto a track and to advance this billet, along with the row of billets ahead of it, through the heating slot.

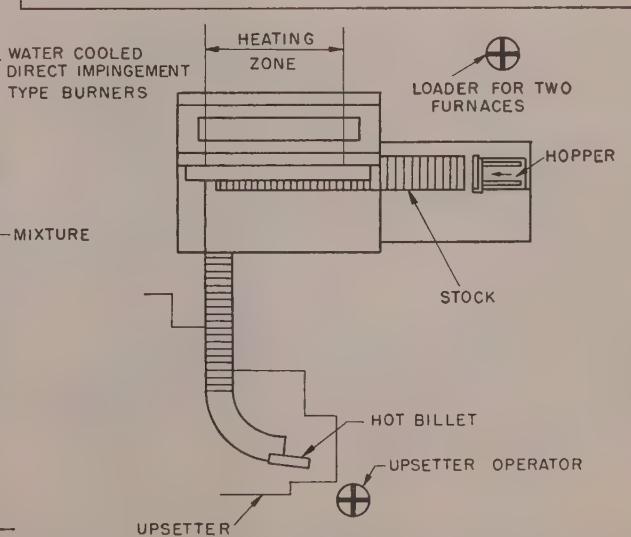
One-Man Job—Motors and mechanism for driving the pusher are housed in cabinets back of the heaters and below the magazines, which are loaded by hand in vertical slots that fit the billets, stacked one above the other. With this arrangement, one man can take billets from the hopper and stack them by hand in the two magazines as rapidly as the billets are fed out.

At each forward stroke of each pusher, one billet is wiped from the bottom of the stack in the magazine and drops onto the track along which the billets are advanced through heater slots. At the lower side, the track includes two angles which extend along below the slot, one of them constituting an adjustable stop. They guide the lower end of the billets while they are being advanced.

If forging or other delays occur, the lower stop angle can be dropped by a release lever so that billets



Left, vertical sectional view of high-speed billet heater, showing cross-shaped slot through which billets are advanced by a pusher as they are heated to forging temperature. Below, floor plan of furnace and accessory equipment



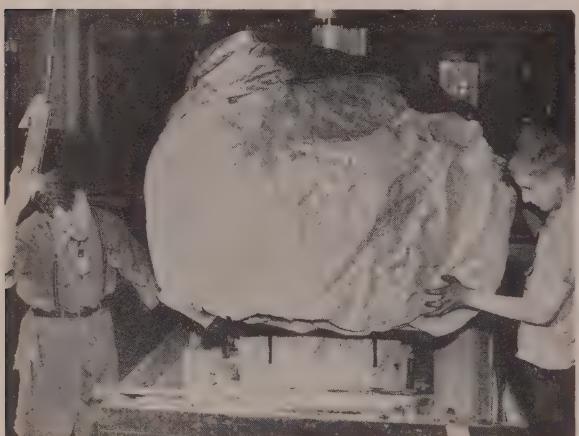
already heated will fall onto a tray and not be overheated by remaining in the slot. While being advanced longitudinally through the slot, billets rest at 45-degree angle and their upper portion is guided by the slot itself. As each billet reaches the end of the heating zone, its lower end clears the stop angle and the billet slides down automatically onto the short roller conveyor that carries it to the operator of the header.

Barrier Materials Seal Out Corrosion

FLEXIBLE barrier materials for military packaging must be able to "take it" in low temperature service as well as in tropical and temperate climates. New materials meeting these specifications are available and cost less than the wrappings devised in the early 40s when the principal requirement was the use of the least critical materials cost was secondary.

One barrier material that meets military specifications for Method II preservation is Metalam made by Dobeckmum Co., Cleveland. It consists of aluminum foil laminated to vinyl plastic film and polyethylene film and then to scrim cloth. It is largely impervious and the metallic layer resists oils, greases and organics in general. It is also resistant to acids of some kinds. VPI, the vaporizable organic rust inhibitor, may be incorporated in the wrap or placed within it.

Method II preservation is primarily designed to afford protection in shipment and storage to parts and equipment when the nature and intended usage of the unit, the designation of the unit and the adaptability of this type of preservation to unit preclude other methods of packaging. Units adaptable to this method include: Engines, electrical and radio equipment, delicate instruments, propeller hubs, photographic equipment, guns and other equipment where failure to provide for proper depreservation would result in appreciable hazard to the unit and personnel involved in its use.



Metal pins or aircraft engines are given lasting protection with metal-laminated barrier materials. Heat sealing devices form envelops that conform to the part being protected

With this setup, using one man to keep both magazines loaded and one operator at each header, an average of 1000 forgings an hour is attained. This does not include, of course, labor for shearing billets or for transferring them to and from the heating and forging setup here described. Uniform and high speed heating is accomplished. Thanks in part to the rapid semiautomatic handling setup, the labor charge is low.

Records Compressed By Microfilm

Corrosion Sealed Out—In actual operation barrier materials are used in a converted form such as envelopes, and are closed by heat sealing devices of several types. Usually these heat sealing mechanisms are of the jaw type or rotary disk and are heated by resistance elements. The heat sealing temperature is dependent on the pressure exerted by the functioning portion of the apparatus and also the length of time that this heat and pressure is maintained.

Generally the most commonly used combination of these requirements is 425 to 450° F at 20 psi for 1/3 to 1/2-second dwell as delivered by a jaw type sealer. Another variable is thickness or gage of material being sealed. In the main the optimum sealing conditions are those determined by the individual operators with the type of barrier material being used.

Where a large number of identical pieces are being packaged from a line, a foot-pedal-powered heat sealer is applicable and may lead to greater production. There is no fixed formula for the temperature and time of application, as the room temperature, material thickness and other factors may have constantly changing values.

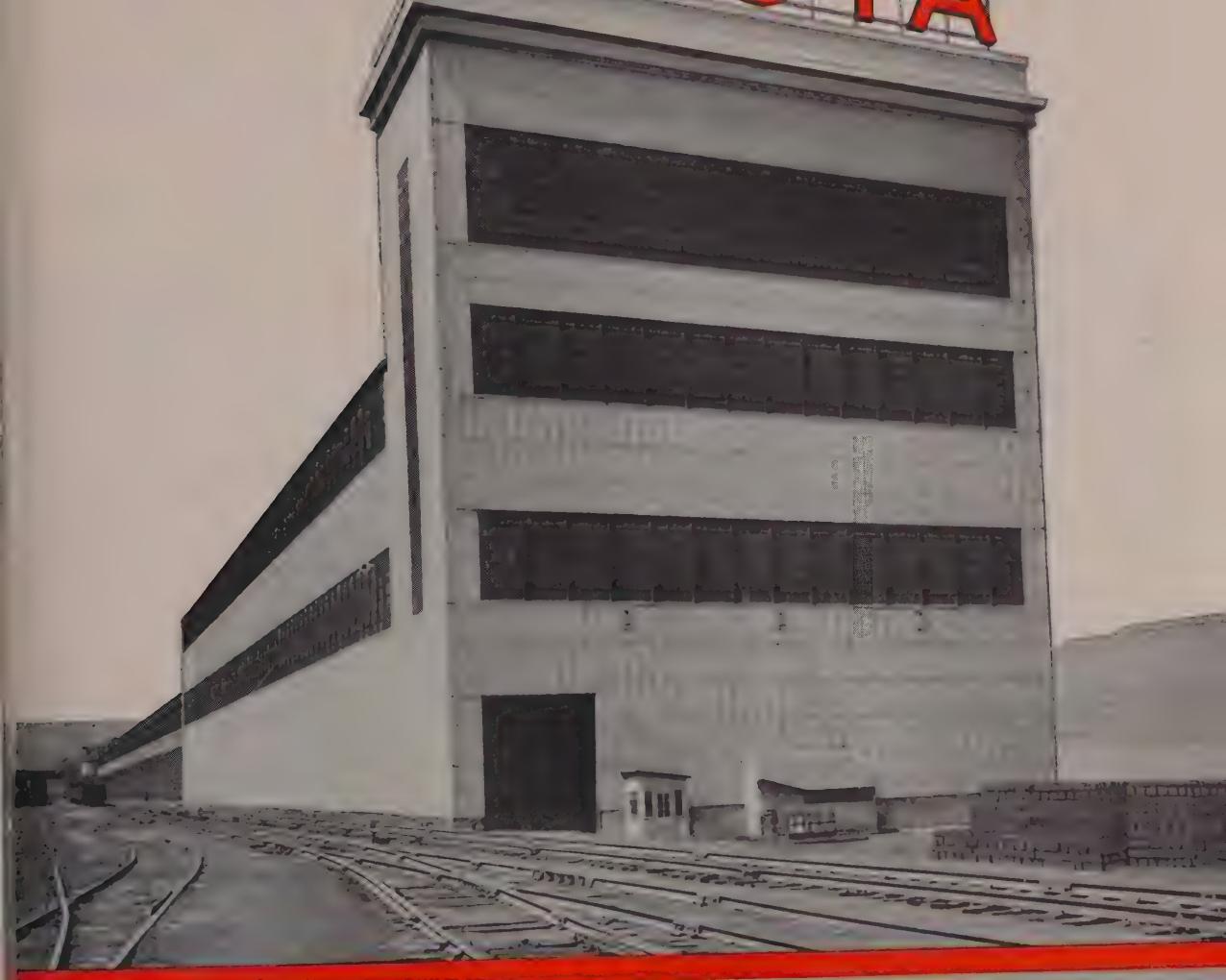
Important Functions — All the materials used in making Metalam serve important functions in providing a better flexible package. The aluminum layer is a support for the sealing vinyl layer and a barrier between it and the polyethylene. It provides the resistance to oils, greases and organics in general plus some acid resistance. Any pinholes in the aluminum are filled by the resistant vinyl or polyethylene resins bonded to it. Aluminum has fair tensile strength but little resistance to tearing.

Depending on the size of the article being packed and the stresses to which the barrier sheet will be subjected, the thickness and strength of the cotton scrim layer is increased or reduced. Cotton is the cheapest and one of the strongest textiles. The woven cotton resists tearing and aids importantly in helping guard against pilfering since the wrap is tough and hard to open and reclose without detection.

Records Compressed By Microfilm

Personnel records required by the Defense Department for firms working on military contracts, can be handled by the Kard-a-Film method developed by Remington Rand Inc., New York. Vital statistics are put on microfilm and inserted on a special card. A normal file drawer holding from 3000-4000 sheets can hold up to 250,000 letter-size film records.

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MESTA MACHINE COMPANY

PITTSBURGH, PENNSYLVANIA

HEALD'S 125th BIRTHDAY: America's machine tool industry definitely has come of age. Fiftieth birthdays now are common. Seventy-fifth anniversaries are not unusual. Centennials have been celebrated by at least three companies.

This week, however, Heald Machine Co. of Worcester, Mass., holds open house to commemorate a truly extraordinary combination of industrial and managerial longevity. "Born in 1826 and still going strong"—this organization has maintained an unbroken record of Heald family management for 125 years.

When Stephen Heald started the business in 1826, it was a small woodworking shop beside a mill dam in the central Massachusetts village of Barre. At that time, Eli Whitney—father of interchangeable manufacturing—had been dead less than a year. As yet there was no American machine tool industry.

Pioneering with a line of farm equipment including ox bows, corn cob crushers and cheese presses, Stephen Heald soon found it necessary to add a blacksmith shop, gray iron foundry and machine shop to his facilities. Like other industrialists of that era, he designed and built his own machine tools.

Stephen's son Leander S. Heald came into the business as a partner in 1864 and S. Heald & Son broadened their line to include "air-tight stoves," hay tedders and a patented horse rake which stacked as well as raked the hay. Their first venture into the industrial tool field was a sash trimmer.

When venerable Stephen Heald died in 1887 at the age of 86, James N. Heald—son of Leander and an 1884 graduate of Worcester Polytechnic Institute—became his father's partner. With the advent of James, the company became L. S. Heald & Son.

New Machine Tool Era Dawns

Convinced that grinding was destined to become one of the major machining methods, James N. Heald "eased the company into the grinding machine business" with a hand cranked attachment for truing hardened centers and for various other external and internal grinding operations in lathes. He followed this with a guided twist drill grinder which did away with "free-hand" methods then in vogue.

"And now," to quote from the 125th anniversary brochure prepared by historian Lew Hastings, veteran advertising manager of Heald, "we come to the year 1903. James Heald—then 38—realizing that the business was handicapped by its rural location, wanted to move it to the thriving city of Worcester, 21 miles away, where more adequate supplies of labor and materials, better transportation and additional capital would be available.

"Leander Heald—then 67 years old—was not interested in moving away from Barre. After much discussion, James finally obtained an option to buy his father's share of the business. With a wife and two boys, James had been unable to accumulate any financial resources out of his modest salary.

"He went to Worcester, put up at a small boarding

house and—in the best tradition of an Horatio Alger hero—went out daily in search of capital necessary to bring the business to Worcester. Charles H. Morgan of Morgan Construction Co. was favorably impressed. His two sons, Paul and Ralph, decided to subscribe for stock, as did Oliver B. Wood, proprietor of Commonwealth Press, and John W. Harrington of Harrington & Richardson Arms Co.

"Literally on the last day of the option period—the only train to Barre having left—James Heald and Ralph Morgan drove by horse and buggy to Barre with the cash in a bag under the seat. They closed the deal with Leander Heald.

"On August 23, 1903, Heald Machine Co. was incorporated, with James N. Heald treasurer and general manager, Paul B. Morgan president, and John W. Harrington clerk. Operations soon were underway in a 90 by 100 foot rented building.

Things Move Fast in Worcester

Originally there were 17 employees in this Worcester shop, and its products were similar to those made at Barre—but not for long. Machine tools developed by J. N. quickly gained ascendancy. First came a 6-inch rotary surface grinder for the sides of automobile piston rings. Next J. N. tackled the problem of grinding bores of automobile cylinders.

Result was a successful planetary spindle machine of which hundreds were sold. Internal grinders of work-revolving type were introduced in 1908, hydraulic table traverse was applied to them in 1922, automatic sizing—Size-Matics and Gage-Matics—came later in the 1920's, and about 1930 appeared the internal centerless with magazine feed.

In the meantime J. N. had been experimenting with a "single point diamond boring machine." When cemented carbide tools became available in the late 1920's, this machine quickly was adopted to their use—not only for precision boring, but also on turning, facing, fly-cutting, etc. Hence the Bore-Matic.

Today, Heald Machine Co. occupies 350,000 square feet of floor space, employs 1500 people, and supplies grinding and boring machines—and highly specialized fixtures for these machines—to a world-wide market.

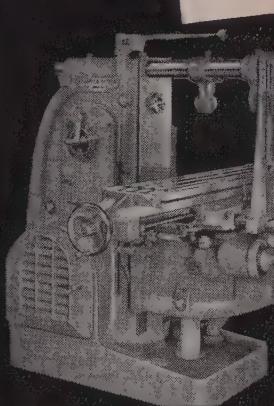
James N. Heald—whose rare combination of engineering ability, economic foresight and personal initiative transformed a small town "job shop" into one of America's outstanding machine tool companies—died in 1931 at the age of 66. By that time he had brought his four sons into the business. Roger now is chairman of the board, Richard is president and Robert vice president. The promising engineering career of Stanley was cut short by death at 28.

Ralph Waldo Emerson wrote: "An institution is the lengthened shadow of one man." With that in mind, this 125 year old Heald institution can well be symbolized by overlapping, ever-lengthening shadows of four generations of Healds. May their shadows never grow less!

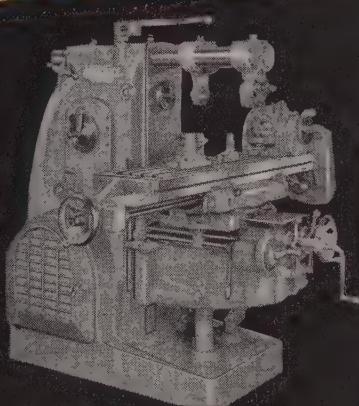
Kearney & Trecker Announces . . .

THREE NEW KNEE-TYPE MACHINES

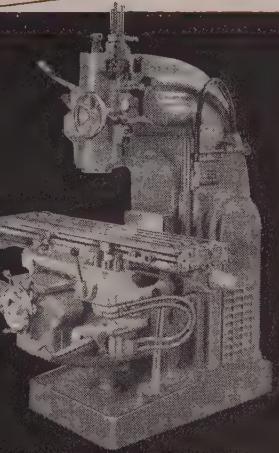
3 and 5 Horsepower



New 3hp No. 2 Model CHL
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New 5hp No. 2 Model CH
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New 5hp No. 2 Model CH
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Automatic Cycle Table Control.

New Kearney & Trecker No. 1 CH, No. 2 CHL and No. 2 CH Milling Machines (Plain, Universal, and Vertical Styles) have every performance-proven operating and construction feature needed for modern short-run or production milling requirements

These specifications point up the new larger working ranges of these new machines. You'll find they provide you with new major cost-cutting possibilities for toolroom and production work. Feeds and speeds listed are standard ranges. Optional ranges available.

Machine	Working Surface	TABLE		Power Rapid Traverse — " Per Min.	Not'l Std. Taper	Speeds — Number and Range
		Power Feed Travel	Feeds Number & Range			
No. 1 Model CH Plain, Universal and (swivel head) Vertical	40" x 10½"	Long. 22"	22"	16—1½" to 32"	150"	40 16 — 25 to 1500 RPM
		Cross 8"	10"	16—1¼" to 16"	75"	
		Vert. 17"	16"	16—1¼" to 16"	75"	
No. 2 Model CHL Plain, Universal and (swivel head) Vertical	46" x 10½"	Long. 28"	28"	16—1½" to 32"	150"	40 16 — 25 to 1500 RPM
		Cross 10"	10"	16—1¼" to 16"	75"	
		Vert. 17"	16"	16—1¼" to 16"	75"	
No. 2 Model CH Plain, Universal and (sliding head) Vertical	50" x 12"	Long. 28"	28"	16—1¼" to 32"	150"—plain & vert. 100"—universal	50 16 — 25 to 1500 RPM
		Cross 10"	12"	16—1¼" to 16"	75"—plain & vert. 50"—universal	
		Vert. 18"	15"*	16—1¼" to 16"	75"—plain & vert. 50"—universal	

*Add 4" vertical travel for sliding head

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MACHINE TOOLS



Radioactive Tracers Aid Blast Furnace Research

Time required for gas to travel from tuyere level to stockline and the rate of lining wear are determined by inert radioactive gas

By E. W. VOICE
British Iron & Steel Research Association
London

RADIOACTIVE tracers recently have been used in Great Britain to develop new techniques for measuring the time of gas transit through the blast furnace and the rate of refractory wear in the lining.

Measurement of Gas Transit Times—Radon is used, being the most easily available inert radioactive gas. Forty millicuries of radon at a time, contained in about 12 gold tubes each about $\frac{1}{2}$ -cm long and $\frac{3}{4}$ -mm diameter, are injected through one tuyere of a blast furnace by an electric detonator and a ballistite charge which shatters the gold tubes and sweeps the gas into the furnace. (Fig. 1)

Through a flexible metallic tube above the stockline and vertically above the tuyere through which the radon is projected, samples of gas are withdrawn at 1-second intervals, (Fig. 2), and are subsequently analyzed for their radioactive content. Fig. 3 shows the results of an experiment on a stack with a 20-ft hearth operating on low-grade Northamptonshire ore in England. Although the word "speed" is used for convenience in interpreting these results, the actual path of the gas is obviously not known. It is essential that this should be borne in mind when estimates are expressed in feet per second.

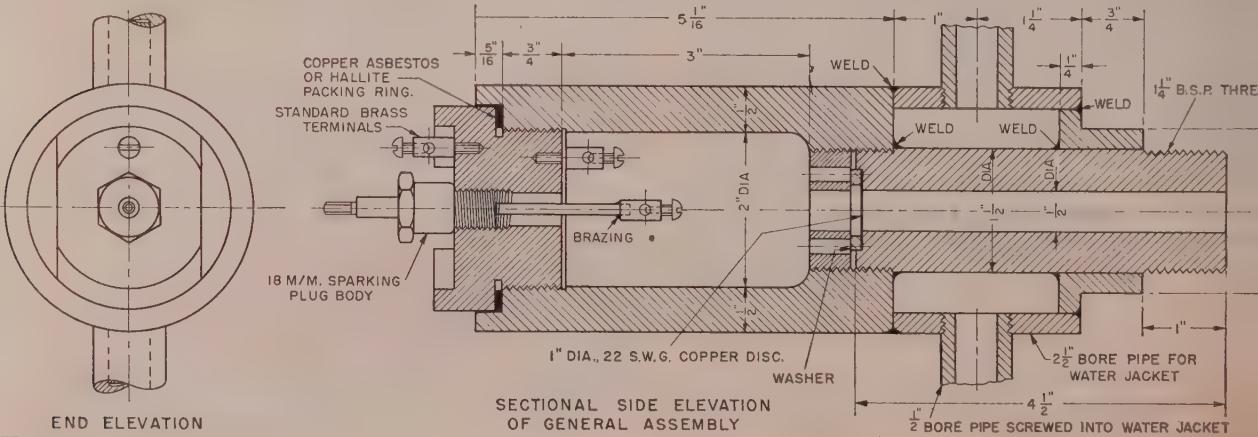
It will be seen that the transit time of the gas is considerably less near the furnace wall than in the center of the furnace, taking just over 3 seconds to reach the maximum radioactivity at the wall against over 8 seconds at the center, equivalent to 22 and 8

fps, respectively. A series of five other experiments sufficiently confirmed this reading to warrant the following deductions, in addition to the gas transit time readings already noted:



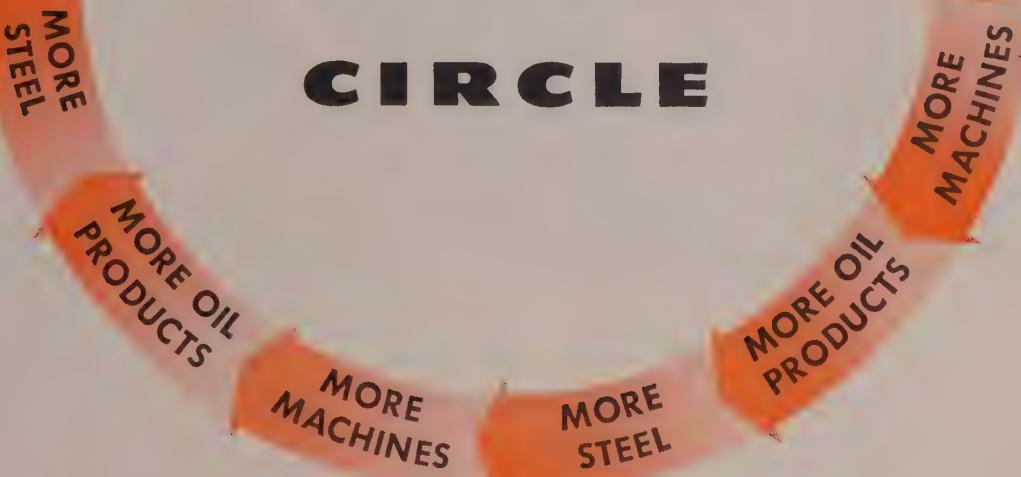
Fig. 2 (above)—Gas sampling at top of a blast furnace vertically above injecting tuyere

Fig. 1 (below)—Detonating apparatus for injecting radon into a tuyere



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CIRCLE**



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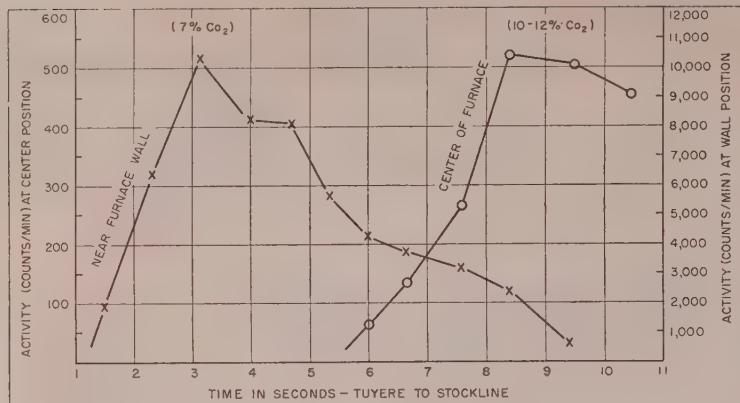


Fig. 3 (above)—Tuyere to stockline gas transit time readings on a 20-foot hearth blast furnace

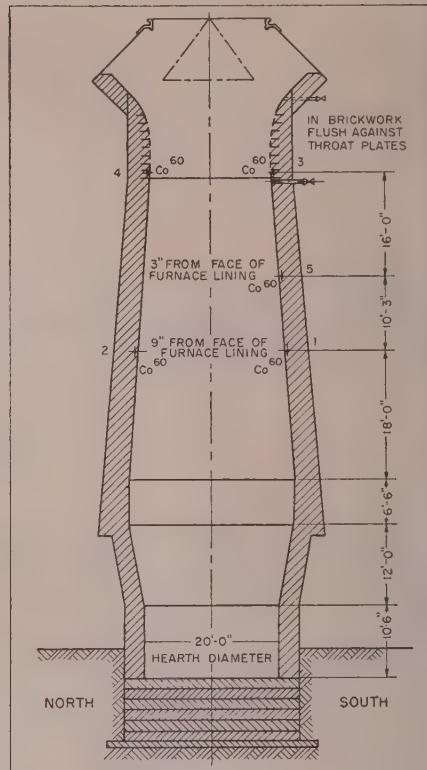
Fig. 4 (right)—Positions of Co⁶⁰ pellets in lining of Stewarts & Lloyds Ltd. stack at Corby

1. Value of CO₂ in the gas is lower at the wall.
2. Gas temperatures are higher at the wall.
3. Rate of descent of burden is greater at the wall.

Other experiments have confirmed this general picture, which provides an interesting comparison with previous attempts to measure gas velocities. Kinney used a pitot tube to measure the dynamic head. Results obtained on a 19-foot 4-inch diameter furnace suggested that free area for flow of gas in burden was 8 per cent and gave gas velocities of between 70 and 450 fps in different positions. The pitot tube was 1½-inch diameter and was driven into burden through holes in the side of the furnace. Use of the pitot tube has the objections that it will measure pressure drops as well as dynamic heads, and that the presence of the pitot tube itself must affect the free area in the burden adjacent to the tip, which would in turn influence the reading from which the velocity is calculated. It is thought that the technique of using radioactive tracers avoids these disadvantages, and provides a useful means of exploring further the effects of burden porosities and the times of contact between the gases and solids, matters of obvious importance in connection with high top pressure and other developments in blast furnace operation.

Measurement of Refractory Wear—Use of radioactive tracers for this purpose has reached beyond the exploratory stage, and though a good start has been made in five initial installations, definitive results are not likely to be available for some time.

Cobalt-60 is used, as a source of gamma rays as it lasts a long time, gives a strongly penetrative radiation and is quickly and cheaply produced from Co-59 in an atomic pile. In the stack, bosh or tuyere belt where the counter can be brought within about 2 or 3 feet of cobalt pellet, radioactive tracers have been built into the lining bricks of five furnaces, their activity being detected from outside the shell. One installation has also been made in the carbon hearth bricks of one of these furnaces, where the counter cannot be brought near enough. When



wear on the hearth releases the pellet into the iron, all the iron will become active. If samples are kept at each cast, then by showing the samples to a counter, weeks later if necessary, it will be possible to say when the pellet entered the iron. It must be emphasized that the counters are extremely sensitive and the activity envisaged is only roughly equal to the effect of adding the luminous paint from one wristwatch to every hundredweight of iron.

Available details of the installations mentioned, are as follows:

The first pellets tried were in No. 4 furnace of Stewarts & Lloyds Ltd. at Corby. Reliable absorption coefficients were not then available so some pellets gave activities at the shell of only about double background. This made detection difficult. Five 10 mC (millicuries) pellets were protected by silica sheaths and installed in November 1949 in positions as shown in Fig. 4. After four months the positions behind the wearing plates (3 and 4) were undetectable. Due to the low intensity (they are over 3 feet from shell surface) it is not certain that the pellets plus wearing plates have disappeared, because, should brickwork have swollen say 6 inches taking the pellets further away from the counter, then a similar result would have been obtained.

Pellets 1, 2 and 5, however, still show their presence although the intensity has dropped some 50 per cent. This could be due to chemical attack and removal of some cobalt (thought unlikely) or carbon deposition within the brickwork or the brickwork swelling, taking the pellets further away from the shell. When more information is available, it should



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- ✓ oil labyrinth
- ✓ inaccessible spot facing
- ✓ external necking
- ✓ precision undercutting

Model J-F recessing tools can be supplied with standard Morse, adjustable adapter, quick-change, straight or special shanks. Circular form high-speed steel or carbide tipped cutters can be used as required.

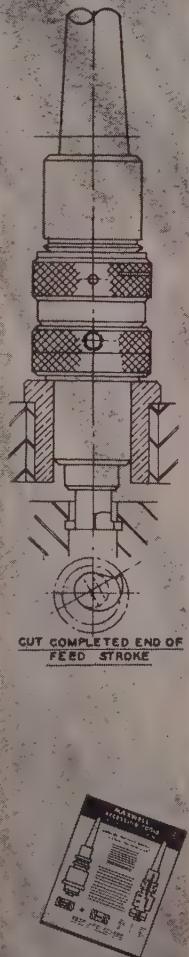
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be possible to interpret the results—the main difficulty is due to the mC pellets being up to 3 feet from shell. If a 2 foot limit is adopted for a 10 mC pellet, much more certain results should be obtained.

Two pellets were installed by the United Steel Companies Ltd. in No. 1 stack at Appleby-Frodingham—one 11 inches from the working face of lining and 47 feet 3 inches above center line of the tuyeres, and the other 11 inches from working face of the lining and 47 feet above the tuyeres. These give counts about 8 to 10 times background, but as the furnace was blown in during April 1950, only a few results are available. Pellets were cast into open alumina crucibles and loose lids were wired on with platinum wire. It is therefore certain that if and when the stack lining wears away, the cobalt will enter the metal. There is, however, the doubt that the cobalt might evaporate or disappear chemically although it may be possible to detect this by a gradual loss of activity as measured at the walls. In fact, the pellets 6 inches from the inwall disappeared after 9 weeks and appeared in the metal. The pellet 1 foot from the inwall is still (one year later) in its original position.

Colvilles Ltd. have installed some 10 mC sealed alumina pellets in positions in the stack and positions adjacent to the slag notches. Two others have been fitted in the iron notch brickwork to show if and when the original brickwork is replaced by clay. Here distance from the pellet to counter is over 2 feet 6 inches but a probe type counter can be pushed down the drilled hole before tapping. Both iron notch pellets had gone within 9 months, while the stack pellets remained in their original location.

Sheepbridge Co. Ltd., have installed on a furnace, which is soon to be blown in, a 5 mC open alumina pellet at the junction between the carbon hearth and brick stack. This will be detectable at the shell, because the distance is not great. They will also use 2 mC in an open alumina crucible in a firebrick laid as part of the protective course on the top of a carbon hearth. A pellet of 2 mC was chosen as just enough to detect and not enough to be objectionable, bearing in mind two points.

1. It may enter the metal in the first tapping, which may be only 20 tons.
2. The metal is cast into pigs and may suffer little dilution before being cast by founders.

Dorman, Long and Co. Ltd. have

included cobalt pellets near the hearth jacket of a furnace by drilling and inserting the pellet in the rammed carbon between the brick-work of the furnace and the hearth jacket itself.

REFERENCES

"A Radio-Active Technique for Determining Gas Transit Times in Driving Blast Furnace," by E. W. Voice, *Jl. of Iron and Steel Inst.*, November 1949, vol. 163, p. 312.

Discussion on above paper, *Jl. of Iron and Steel Inst.*, December 1950, vol. 166, p. 315.

"Radio-Active Indicators for Blast Furnace Refractory Wear," by E. W. Voice, *Jl. of Iron and Steel Inst.*, February 1951, vol. 167, p. 157.

"The Blast Furnace Stock Column," by S. P. Kinney, U. S. Bureau of Mines, 1929, Tech. paper 442.

New Generator For Alabama

A new turbine-generator is being built by Westinghouse Electric Corp. for installation early next year at the Gorgas, Ala., power station of the Alabama Power Co. Valued at nearly two million dollars, the 100,000-kilowatt turbine-generator unit will be about 72 feet long and weigh 900,000 pounds. Westinghouse engineers estimate that the unit will nearly consume its own weight in steam every hour in rotating the 70-ton rotor 3600 revolutions per minute. Tip speed of the last row of turbine blades will be 942 miles per hour—well above the speed of sound.

It will require about 90 minutes to bring the generator to its peak operating speed, and take 30 minutes for the unit to coast to a standstill.

Vibrating Screen Book Issued

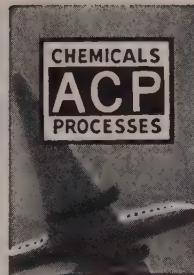
A complete, new 20-page illustrated book concerning vibrating screens for the fast, accurate dry-screening of light and fine materials, and other models for low-cost, high speed separation of solids from liquids, has been published by Link-Belt Co.

Both types of screens are available in a wide range of sizes. One model can be furnished with single or multiple decks, and with semi-enclosed or totally enclosed steel housings where required.

Descriptive material includes specific information on how to select the right screen and screen cloth for maximum operating efficiency; dimension tables, weights, horsepower requirements; and other data of value to the engineer.

Shown are a variety of actual installations which include sizing, scalping, removing foreign matter, reclaiming oil well drilling mud, and removing solids from factory waste water to recover usable materials and/or avoid pollution of streams and waterways.

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Better Plating Methods Discussed by AES

WAYS of improving electroplating techniques and controlling quality were thoroughly discussed at the American Electroplaters' Society convention in Buffalo, July 30 to August 2. Following are abstracts of some of the papers presented.

Organic Coatings in Today's Metal Finishing, by Donald R. Meserve, United Chromium Inc., Carteret, N.J.

Clear lacquers or synthetics are often used in normal times to supplement metallic finishes, but when shortage of metals for plating occur, these organic coatings can be used in other ways to make bright metal finishes possible in spite of governmental restrictions on the use of critical metals such as copper, nickel and brass.

Bright chromium plate without an undercoating of nickel would not be a practical finish for most conditions of exposure were it not for the fact that special clear baking synthetics having the necessary hardness, clarity, gloss, adhesion, abrasion resistance, and resistance to humidity and salt atmosphere have been developed to protect and supplement the chromium.

Long experience in the formulation of clear coatings for normal use in the hardware, sporting goods and other industries has provided a sound background from which technologists have been able to progress rapidly in the development of organic coatings that have the desirable properties for new uses.

Acrylic alkyd - ureaformaldehyde, and melamine - formaldehyde - alkyd resin combinations have been found to be the most suitable for metal-finishing purposes. Most specifications written for these materials are more stringent than those for the usual copper-nickel-chromium finishes. Dry - film thicknesses range from 0.0005 to 0.002-inch, and the films are baked for 20-30 minutes at 250°F or as little as 7-10 minutes at 400°F. Excellent adhesion is possible when proper surface preparation is employed.

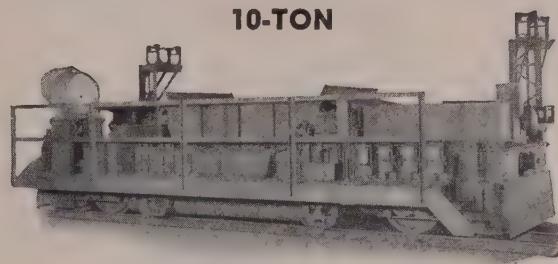
A chromium - like appearance can be attained with bright zinc which has been clear-dipped and protected with clear synthetics. Extensive use of this finish in the refrigeration industry has not only proved its value, but has also provided extensive experience in the detection and rem-

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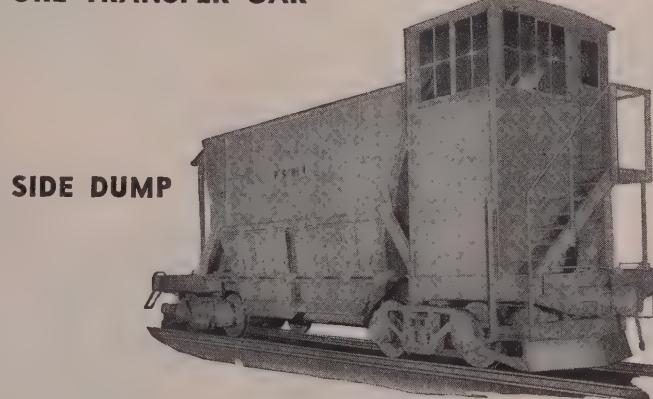
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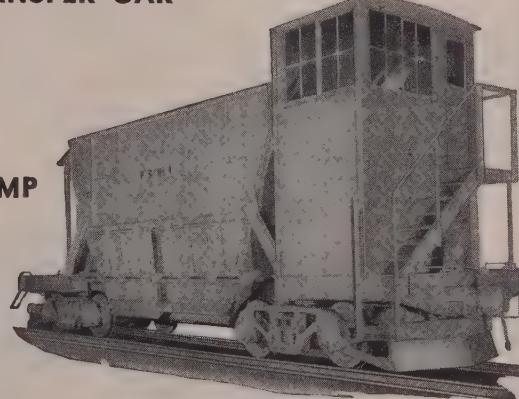
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edy of troubles which may be encountered.

Tinted clear coatings may be used to simulate gold, copper and brass, and can be applied to chromium, zinc, stainless steel and aluminum. Opaque, pigmented coatings are, on the whole, unsatisfactory as substitutes for metallic deposits, and consumer resistance to them is high.

Mechanical Finishing of Zinc Base Diecastings Prior to Plating, by M. R. Caldwell, assistant vice president, Doeher-Jarvis Corp., Grand Rapids, Mich.

A properly designed die with a well polished and chromium plated cavity should produce diecastings with a surface that would need no buffing prior to plating. However, even in the absence of surface defects as the casting is removed from the die the parting lines must be trimmed off and polished, and these operations generally cause nicks and scratches that necessitate buffing of the entire bright area.

The dense "skin" on the casting should be preserved during buffing in order that the number of corrosion spots in use be kept at a minimum. Only very shallow pores in the surface can be bridged during copper-nickel plating; others can be removed by polishing or hard buffing for maximum corrosion resistance. However, air pockets in shallow pores will expand during baking of the plated castings and raise blisters.

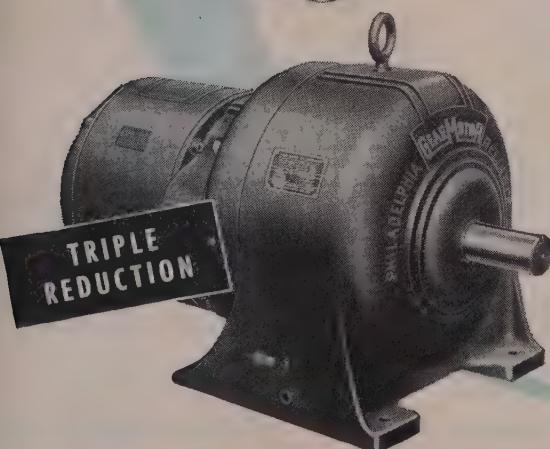
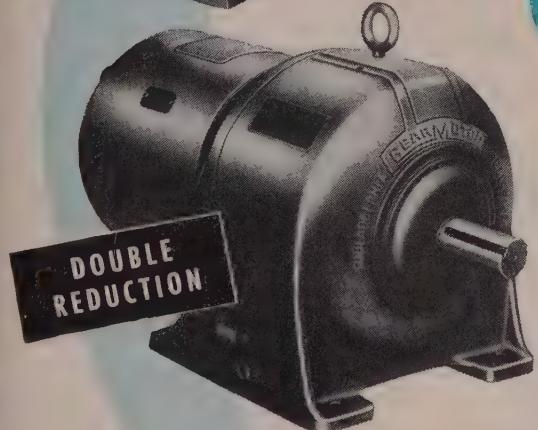
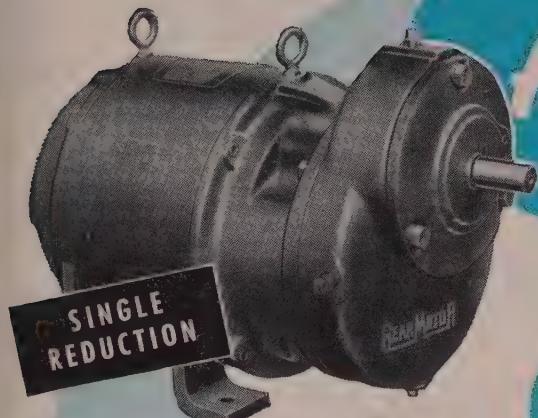
Machine finishing is a necessity to reduce cost and meet production requirements in the author's plant with its large production—in 1950, 280,000 castings daily, weighing 0.43 pounds on the average and 15.5 pounds maximum.

Size and contour, required final finish, presence of holes and threads, possibility of distortion and adaptability to automatic machine polishing are factors which are taken into account in the choice of finishing method.

Many small parts are barrel burnished, sometimes after a strapping (belt polishing) of the parting line, in two-compartment, 32-inch diameter, 60-inch long barrels, run at 30 rpm at first and then 6—10 rpm for final coloring.

Parting lines are usually strapped, by hand or automatically, before buffing. Abrasive belts are preferred to setup wheels because of elimination of skilled labor and savings in material and labor. Polished areas and coarseness of polishing grain are continually kept at the minimum required by the condition of the part, and use of grease stick at a maximum, to reduce cost of subsequent

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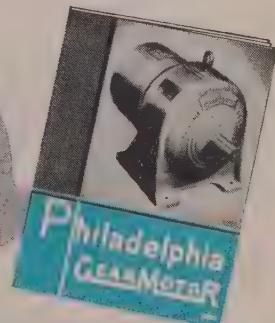
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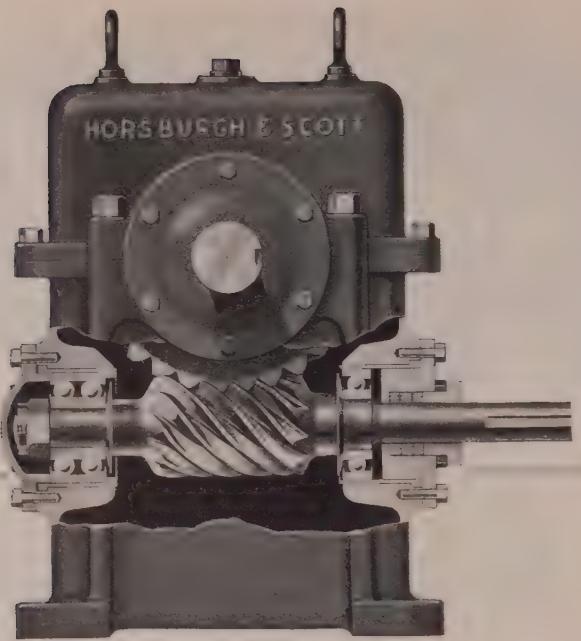
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buffing. Type of buff and buff speed are carefully selected for the same reason.

Liquid tripoli buffering compounds are rapidly gaining favor, even in hand buffering, and are carefully selected for minimum consumption, buff wear, and ease of removal by cleaning. Applications can be made automatic. The recirculating pump-type system is preferred over the pressure-can system because it eliminates transfer of compound and keeps it uniform.

A wide variety of automatic buffering machines are used: Semiautomatic, reversing type with only one fixture (two to a part), straight-line and return-type full-automatic with fixture guides and tilting mechanisms. Areas not reached on the machine are touched up by hand, sometimes with a portable high-speed head when the fixture is turning an end of a return-type automatic.

Optimum wheel pressure, once set, is controlled by an ammeter on the motor, which automatically considers the wheel speed.

Nickel Plating with Insoluble Electrodes, by W. A. Wesley, D. S. Carr and E. J. Roehl, research laboratory, International Nickel Co., Bayonne, N. J.

Although a nickel plating process which involves insoluble anodes would not be attractive to the decorative-plating industry, it offers distinct advantages in such other fields as plating steel strip and wire, electro-forming screens, plating rolls, and plating the inside of tubes. Principle difficulty with the process in the past has been in devising means for replenishing the nickel content of the bath cheaply and with good control.

Replenishment can be accomplished on a continuous basis for a chloride-free nickel plating bath by means of a process which involves circulation of the electrolyte through a plating tank, a regeneration tank, and a filter. Nickel is dissolved in the regeneration tank at a controlled rate with the aid of periodic reversal of the current, and the pH of the solution increases. In the plating tank the nickel content of the electrolyte is depleted, and the pH decreases. If the electrode area in the regeneration tank is adequate, the composition and pH of the electrolyte can be controlled simply by adjusting the current in this tank.

Under these conditions, the cathode current efficiency in the plating tank was 68 per cent, and the power consumption for dissolving nickel in the regeneration tank was 0.78 kw-hr

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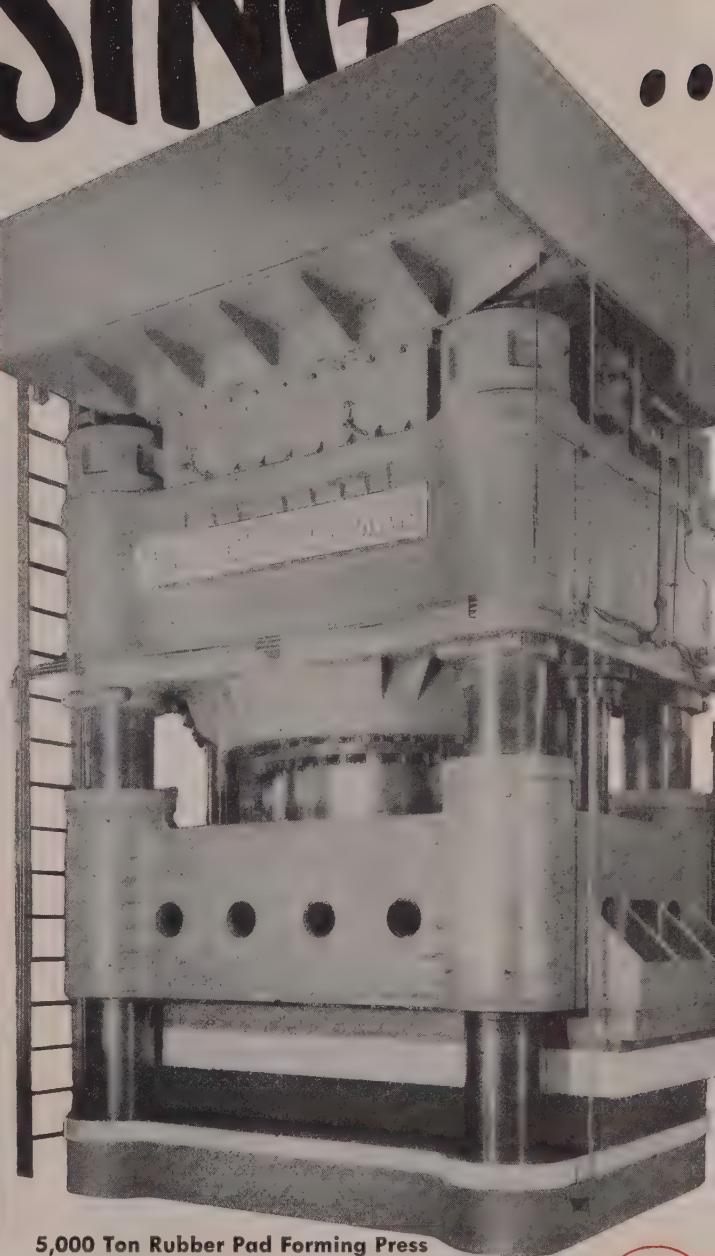
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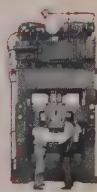
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per pound. Power costs for the regeneration cell are small, because it can be operated with close electrode spacing, a low current density and a series - parallel electrode arrangement.

Nickel deposits from the chloride-free bath have approximately the same mechanical properties as those obtained from a Watts bath. The hardness and tensile strength are a little higher, and the ductility somewhat less.

The process does involve a problem in ventilation, in that copious quantities of gases are liberated at electrodes and give rise to considerable spray.

Chromate Treatments, by Charles W. Ostrander, Allied Research Products Inc., Baltimore.

Chromate treatments are employed to prevent the formation of voluminous white corrosion products on zinc and cadmium surfaces, and to polish or color these metals.

Chromate conversion coatings on zinc, cadmium and in some cases aluminum surfaces are produced in three basic types of chromate solutions operated at pH's below 7. Within each type there are variations in procedure or conditions of operation which will lead to films having specific colors, corrosion resistance, or other properties.

The simple dip solutions for chemical polishing are operated at pH values of 0.0-1.5, and in 5-60 seconds yield lustrous coatings of medium corrosion resistance on zinc and cadmium which range in color from clear to light iridescent yellow.

Single - dip nonpolishing solutions operated at pH 1.0-3.5 will produce in from 5 seconds to 5 minutes medium-to-heavy films ranging in color from iridescent yellow to bronze, olive-draught and black. Such films provide maximum corrosion protection, and, with the exception of black films, can be dyed red, green, blue or black with certain alizarine and diazo dyes. This general type of solution and procedure is applicable to aluminum and its alloys as well as to zinc and cadmium.

Solutions which require anodic treatment of the work will produce yellow-to-black films on zinc at current densities of 5-50 asf at pH values of 2.5-6.0 in 3-5 minutes. They find use in the aircraft industry for the production of black films and in refrigeration for clear films.

A New Degreasing Evaluation Test: The Atomizer Test, by H. B.

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If you're interested in production savings like these, send for our new booklet B-4782, "Induction Heating . . . The Machine Tool That Makes Tall Stories Come True." Call your Westinghouse representative or write to Westinghouse Electric Corporation, Dept. S-8, 2519 Wilkens Avenue, Baltimore 3, Maryland.



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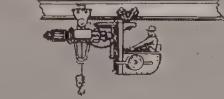
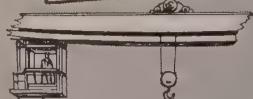
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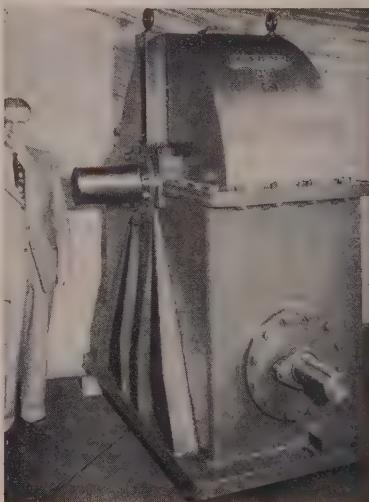
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Linford and E. B. Saubestre, Columbia University, New York

A special specimen for the evaluation of tests for degreasing processes which exhibits uniform drainage has been designed and tested. It comprises a rectangular area of sheet metal with a tongue having an "S" bend at the top and a triangular extension at the bottom. Experience has shown that reproducible soiling and cleaning procedures can be carried out with it.

In the course of a study of tests which have been suggested for the evaluation of degreasing processes, a new procedure appeared to be far more sensitive than previous tests. The specimen to be evaluated is allowed to dry and is then sprayed for 30-45 seconds with a dilute aqueous solution of a dye from an atomizer at a distance of 2 feet with a pressure of about 18 inches of mercury. After being dried with a heat lamp the specimen will exhibit a dye pattern which reveals the areas that were not free of oil or grease. Permanent records can be easily made by tracing the dyed areas with a pantograph. It is suggested that the superiority of the atomizer test over the water-break test is due to its dependence upon an advancing

Worm Gear Is De Laval's Biggest



LARGEST standard enclosed worm gear ever built in the shops of De Laval Steam Turbine Co., Trenton, N. J., will soon go into service on a Mesta slabbing mill installation for a major steel company. It's a 30-inch center distance unit transmitting 200-hp at 410 rpm with a ratio of 17-2/3 to 1. A second unit of the same size is currently being built for installation in another mill.

contact angle instead of a receding contact angle.

The atomizer test was compared with the fluorescent-dye, spray-pattern ferricyanide and copper-dip tests for the evaluation of the residual oil on partially cleaned specimens which had been soiled with lard oil or mineral oil. When considerable residual oil remains on the specimen, the atomizer and fluorescent - dye tests have about the same equivalent sensitivity and are 20 times more sensitive than the other available tests.

The atomizer test improves as the amount of residual oil is decreased and for small amounts may become 20 times as sensitive as the fluorescent-dye test and 600 times as good as the ferricyanide test. Radioactive-tracer techniques may be this sensitive, but they are both expensive and technically difficult, whereas the atomizer test is so simple and cheap that it may be used in even the smallest plating shops.

Requirements of Zinc-Base Diecastings for Electroplating, by Glenwood J. Beckwith, vice president and general manager, Metallon Products Inc., Los Angeles.

Zinc-base diecastings suitable for electroplating can be produced only when due care is exercised with regard to the design of the article, design of dies, casting technique in the foundry, and composition of the zinc alloy.

Design of the article should be such that polishing can be easily accomplished without expensive special equipment or excessive hand labor. The designer should also keep in mind the requirements of the plater with respect to ease of racking for good contact, proper drainage and satisfactory throwing of metal to all parts of the article.

A die which is not properly designed will be the source of castings that contain coarse-grained areas, cold shuts, rough surfaces, and other defects which cause the plater a great deal of trouble and may lead to a ruinous number of rejects. Even trimming dies which are not properly aligned or are otherwise faulty will produce castings that are hard to polish, and the excessive polishing may cause plating troubles.

Foundry technique which does not recognize the effects of metal and die temperatures, lubricants, poor skimming, and the use of excessive amounts of scrap in the pot will inevitably lead to poor castings that will be difficult to plate properly.

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STEEL PICKLING

COILS UP TO 48" WIDE

PICKLING coils:
1" to 48", 10 to 20 gauge
100 to 10,000 lbs.

SHEETS & PLATE: Any width,
any length, any thickness.

CAPACITY: 25,000 tons/month.

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Subsidiary: AMERICAN TOOL & SUPPLY CO.

OFFICE: 822 FRICK BUILDING, PITTSBURGH 22, PA. PLANT: MCKEES ROCKS, PA.

In the Yard or in the Plant...

EUCLID'S "pace"
the Assembly Line

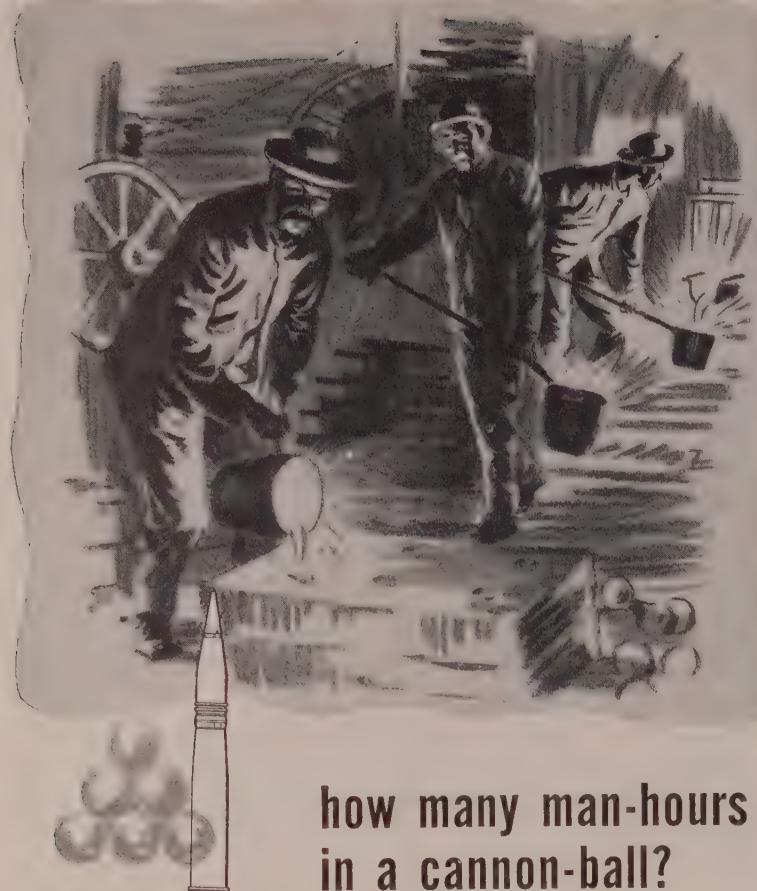
Euclid Cranes prove an important link in the chain of operations required to convert incoming materials into outgoing products in a vast number of manufacturing plants.

Facility of movement through ease of precision control enables "Euclids" to handle a large variety of production operations, and to readily "pace" the assembly line. Write us concerning your crane problems. We'll be pleased to submit a proposal.

EUCLID
CRANES
AND HOISTS
Raise Profits

THE EUCLID CRANE & HOIST CO.

1364 CHARDON ROAD
EUCLID, OHIO



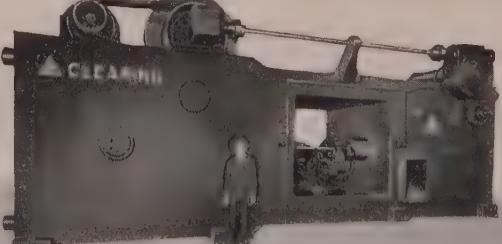
how many man-hours in a cannon-ball?

Many a courthouse lawn still displays those iron balls, once supreme as heavy ammunition. Carefully molded and cast, they took a lot of human labor. Today's war machine uses precision projectiles that explode for maximum effect. These modern cannon-balls are mass produced utilizing press methods, so man-hour requirements are gratifyingly low.

If you make things of metal in large quantities, here's another object lesson. Whether your product is for defense or for civilian needs, Clearing engineers can show you the advantages and economies of press methods of manufacture. Get in touch with us.

CLEARING MACHINE CORPORATION
6499 West 65th Street • Chicago 38, Illinois

This Clearing press
forged projectiles for
World War II.



CLEARING PRESSES

THE WAY TO EFFICIENT MASS PRODUCTION

Even the type of furnace is important.

Some of the impurities which may find their way into diecasting alloys can be the source of important plating troubles. Lead and cadmium are particularly troublesome, and even small amounts will cause blistering after plating. Many other impurities such as tin, promote subsurface corrosion, and cause effects which may be blamed upon the plater.

Advantages of Simplicity in the Electropolating of Automobile Bumpers, by Donald H. Schantz, assistant vice president, Michigan Bumper Corp., Grand Rapids, Mich.

When preparations were made to resume production of automobile bumpers after World War II, the pre-war plating sequence was investigated to determine if a simplification would lead to improvements in quality and costs. A promising and important possible simplification was the elimination of the copper flash, which would not only reduce the number of steps in the sequence but also reduce waste disposal problems.

In the new sequence, cleaning is done in two steps. The first is an anodic cleaner, and the second makes use of alternating current to demagnetize the bumpers and prevent the accumulation on their ends of iron particles which lead to roughness in the nickel deposits. All rinsing is done in spray-rinse tanks.

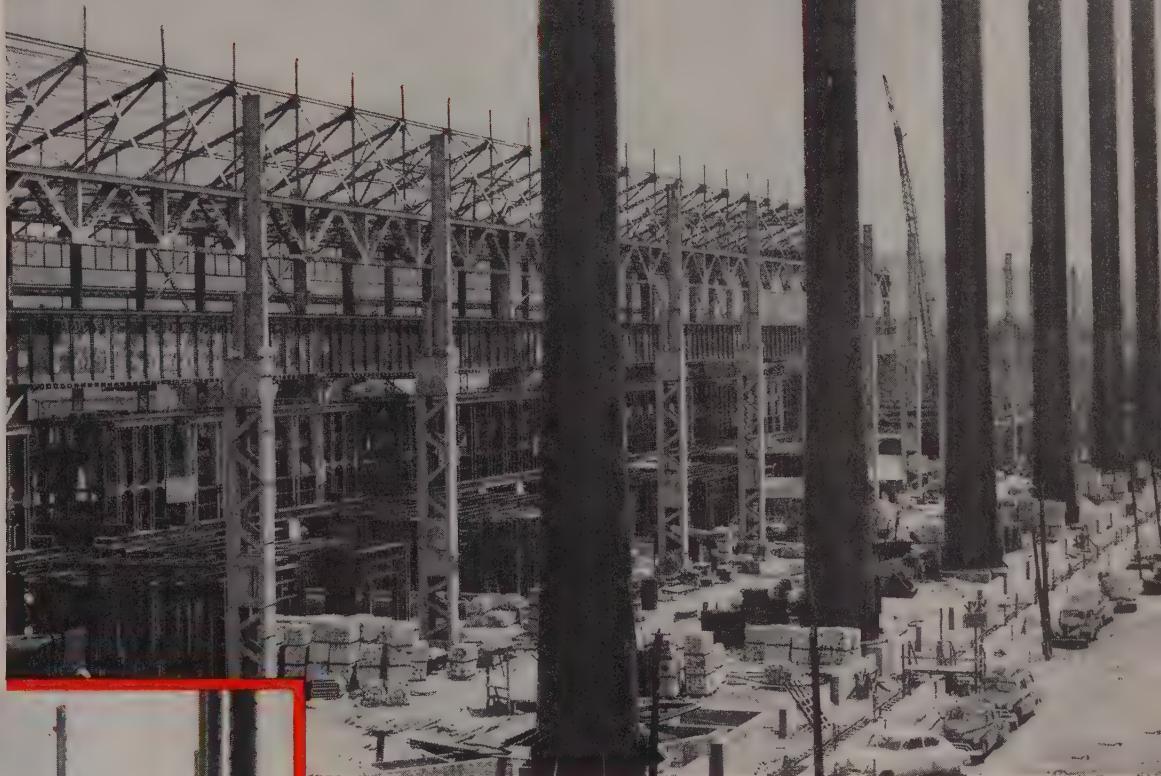
Key to successful adhesion of the nickel directly to the steel lies in the use of an anodic treatment in a solution of 65-70 per cent by volume of 66° Bé sulphuric acid at 60 asf and 80-100°F for 1.5 minutes, followed by a rinse prior to nickel plating. This treatment is responsible for a small amount of smoothing of the steel surface.

Substitution of a proprietary semi-bright nickel solution for a low pH Watts bath and other changes in the nickel plating operation permitted an increase in current density and a decrease in buffing costs.

Cathodic cleaners are used in preparation for chromium plating, and oxidation of the nickel is thereby kept at a minimum. The work is treated for a few seconds at low voltage in the chromium-plating tank under conditions which do not deposit any metal before the working voltage is applied. This helps to secure a bright chromium deposit. Occasional rejects owing to cloudy chromium are stripped of chromium and re-plated.

The product is believed to be equal

Eleven 250 Ton Open Hearths for J & L by *LOFTUS*



These six Open Hearths shown above are nearing completion and are scheduled to go into production this year. The other five will be completed early in 1952.

Open Hearth crews in leading steel plants throughout the country are establishing shop records with Loftus Open Hearths.

We have records in our files showing Loftus designed and constructed Open Hearths are giving

**LOWER FUEL CONSUMPTION
MORE TONS PER HOUR
MORE TONS PER MONTH**

That's why we say "Loftus Builds 'Em Better".

Turn Your Scrap In, Help Turn More Steel OUT



LOFTUS ENGINEERING
Corporation

610 SMITHFIELD ST.

PITTSBURGH, PA.

Designers and Builders
of
INDUSTRIAL FURNACES



In this modern plant experienced workers, operating modern equipment with the newest and most efficient quality control devices, produce Wallingford strip steel and tubing of consistently uniform quality. In analysis, gage, temper, surface finish and every other respect Wallingford Steel meets specifications exactly. Whenever you reorder, in a week, a month or a year, the same uniformly high quality will be delivered. As a result your operations never need vary, the quality of your product will be as uniform as that of Wallingford Steel.

THE WALLINGFORD STEEL CO.

WALLINGFORD, CONNECTICUT, U.S.A.
LOW CARBON • HIGH CARBON
ALLOY • STAINLESS • STRIP and TUBING

WALLINGFORD



STEEL

if not superior to that produced by more complicated sequences. Cost has been low, and the production has been twice that originally expected.

Duplicator Converts Lathe

High machine speeds, simple setup and better surfaces are advantages claimed

HIGH-PRODUCTION machine, claimed to be capable of stepping up machining speeds, simplifying setup procedure and improving surface finish, has been installed on the big Bullard vertical turret lathe in the jet assembly department, of Ryan Aeronautical Co., San Diego, Calif. It is a Turchan hydraulic duplicator. This device converts the vertical tur-



MORE JET COMPONENTS

... time savings are substantial

ret lathe into an automatic production tool with time savings approaching 100 per cent.

It consists of a motor-driven hydraulic pump which supplies uniform oil pressure of 500 psi to a sensitive valve and master control cylinder. The valve is actuated by a tracer point which feels the outlines of a pattern, or template and meters oil directly to the control cylinder. The piston in this cylinder moves a tool slide which supports the cutting tool. When attached to the turret lathe, the duplicator accomplishes exact duplicates of master patterns directly in metal.

Typical application illustrating the versatility of the machine is demonstrated in the machining of flanges

on the exhaust cones for General Electric J-47 jet engines. A template, conforming to the desired contours of the flange, is clamped to the tracer table. The sensitive tracer point is located on the template and the cutting tool is positioned on the flange in exact relationship by means of a micrometer-dial locating control. As the tracer point moves over the outlines of the template, its movement is picked up by the precision valve and translated into the most minute changes in direction of hydraulic oil which is piped to the master control cylinder. The master control piston moves in strict conformity with the oil pressure changes in the lines and operates the cutting tool so that it instantly and faithfully follows the direction of the tracer. Accuracies in duplication within variations of 0.002-inch are obtained.

According to Ryan, this method of generating work shapes from a model has many advantages over conventional methods. Smooth continuous operation of the turret lathe power feed coupled with the floating hydraulic action of the duplicator produces machined work of unsurpassed smoothness—often so smooth that final grinding can be eliminated. Also, it eliminates use of costly form tools and permits utilization of conventional tools which are simple to set up.

Novel Warehouse Planned

A four-story warehouse being erected at East Pittsburgh by Westinghouse Electric Corp. will rank among the most modern in the country, according to E. H. Baird, Westinghouse superintendent of shipping.

Among devices to speed flow of materials in and out of the building will be specially-designed pallet-handling cranes, an electric eye "traffic cop," floating shipping docks that adjust to various truck heights, and a tele-talk communication system for last minute instructions.

"Wherever possible, we will use belt conveyors and endless chains to move goods easily and quickly, and we'll even have a special conveyor to handle the paper work that is a necessary part of any shipping operation," Mr. Baird said.

Five tram-rail cranes, each with a capacity of two tons, will cover the entire length of the ground floor to facilitate loading of trucks and railroad cars. A spur line of the plant railroad will lie along one side of the building, and a dock, capable of accommodating six large trucks, will be located at the south end of the building. A feature of the truck

loading area will be a "floating" dock. Length of the dock will be divided into six sections, each of which can be raised or lowered to conform to the varying heights of truck beds.

At each end of the building, there will be a combination freight and passenger elevator, which will have automatic pushbutton operation. Another special feature will be a conveyor belt to carry products arriving at the warehouse to the second and third floors of the building.

As materials are placed on the conveyor, they will be tagged as to whether they should go to the second or third floor. An electric eye

will divert all the second floor material, but will permit the balance to be carried to the third floor.

The second floor, part of which will be used for storage, will be furnished with pallet racks capable of storing pallets in a triple layer. Two unique cranes, each with a capacity of two tons, will handle these pallets. Instead of the conventional hooks and cables, cranes will be equipped with a solid steel rod extending from the crane carriage to the floor level.

A fork designed to slide under the pallets will move up and down the steel rod. In this way the crane operator will be able to maneuver his



Production Methods Help You Gain Months of Time

Costs are much lower, too

Whenever emphasis is on speed in delivery, or lower costs, consider Spincraft metal fabricating. Of all methods available for cold shaping flat or rolled sheet metals, the spinning lathe, plus special Spincraft forming skills, offers the fastest and least expensive means of getting production rolling. As an example, consider the parts and assembly for the water sterilizer unit illustrated here. From a scratch start Spincraft made required tools, produced components and assembly and began delivery ten days after receipt of the order. Months of time were gained, thousands of dollars saved.

Cases like this are everyday experiences at Spincraft — on both small and large runs. The answer you want cannot be guaranteed, but others have been helped so often and so well that Spincraft has become the world's largest metal spinning and fabricating plant. Call or write



Components for stainless steel water sterilizer — spun, fabricated and assembled in record time at lowest cost.



The function, scope, mechanics and economics of Spincraft metal spinning and fabricating are discussed in this stimulating 40-page, well-illustrated booklet. A copy is yours for the asking.



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Milwaukee 8, Wis.

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Warco

**CAST STEEL O.B.I.
PRESSES IN 60-
75-100 and 150 TON CAPACITIES**



In addition to Warco's line of welded steel Open Back Inclinable presses, we now offer a line of cast steel frame machines at present consisting of 60-75-100 and 150 ton capacity. These cast steel O. B. I. presses embody all the design features and physical properties of our welded

frame press. Careful consideration has been given to proper distribution of metal so as to provide maximum stiffness and rigidity.

Warco is ready to meet your requirements, in choice of construction, with the latest design.

Contact your nearest representative or the factory direct.

THE FEDERAL MACHINE & WELDER COMPANY

WARREN, OHIO



crane into any aisle between the pallet racks and pick up any single pallet.

Also on the second floor will be one station of the endless chain that will operate between the second and third floors. The chain will carry small wire baskets from storage bins to the packaging area. Workers in the warehouse, when they receive an order for smaller articles that are generally stored in bins, will merely place these articles in the wire baskets, and they will then automatically be carried to the packing area.

The third floor will be used for bin storage and cartoning, and will also house the shipping department's offices. Cartons will also be stored on this floor. As materials are packaged on the second and third floors, they will be delivered to the shipping platform by spiral chutes.

Fourth floor of the building will serve as the general offices of the manager of the feeder and service division and his staff, as well as the works engineering offices.

Erection of the new building's steel frame work will begin about mid-September, and the structure will be ready for occupancy about January, 1952.

New Maintenance Manual

Care and maintenance of industrial trucks, important in protecting your investment and assuring continuity of service, is the subject of a manual published by Baker Industrial Truck Division, Baker-Raulang Co., Cleveland.

In the interest of more efficient, more continuous and more economical service from industrial trucks, this 16-page free bulletin contains 51 illustrations of the steps to be taken in preventive maintenance and annual check-ups.

Because of the high current labor rate and the scarcity of good skilled labor, major overhaul jobs should be kept to a minimum. With the mounting costs of essential wearing items, these materials should be conserved as much as possible. It is common sense to make the substantial savings that truck preventive maintenance affords and this manual tells how.

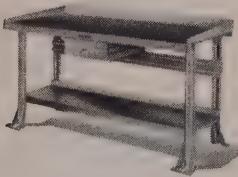
Copper Forging Book Revised

A revised edition of its handy reference booklet on copper and copper-alloy die pressed forgings, is announced by the American Brass Co. To materials engineers and product designers, the 12-page booklet provides practical, to-the-point, comparative illustrations to show what die pressed forgings are—what they can do—what they have already done—



A PRIZE... IN ANY MAN'S LANGUAGE

HALLOWELL



STEEL WORK BENCH!

Everyone dreams of hooking the biggest fish... everybody wants a HOLLOWELL Bench. They're both prizes in any man's language!

The man who buys a HOLLOWELL likes its standard-unit design which simplifies plant layout, its tough, steel construction which reduces maintenance and replacement for years to come, and its trim, good looks that improve shop appearance.

The man who works at a HOLLOWELL likes its smooth, splinter- and oil-proof, durable work surface, its rock-solid sturdiness and its convenience.

Whether you buy or use work benches, you'll want to look over Bulletin 701. Write for your copy today.

—SPS—

STANDARD PRESSED STEEL CO.
JENKINTOWN 33, PENNSYLVANIA

what a manufacturer can expect of them. Booklet contains tabulation of physical properties of copper and copper alloys suitable for forgings. For copies address request to Dept. DPF, Waterbury 20, Conn.

Stops Instrument Snowing

A novel use for a sub-zero industrial chilling machine has been reported by Lear Inc. of Grand Rapids, Mich., aircraft and radio accessories manufacturer. To prevent "snowing" in aircraft instruments subjected to the low temperatures of high altitudes, gases used to fill instrument cases are dehydrated in the minus 130° F temperature furnished by the unit.

Coils of copper tubing were installed in the cooling chamber of the R-120 chilling machine. Hydrogen and helium gases are forced through this tubing and quickly chilled to approximately minus 130° F. Water vapor in the gas condenses out in the form of ice crystals and fine snow. Condensate is trapped by filters before it can enter the supply line. The gases are warmed to room temperature before being used to fill the instruments.

Cooling coils are cleaned periodically by reverse-blowing the ice and snow out. Dry helium is used to purge the hydrogen coil and dry hydrogen to clean out the helium coil.

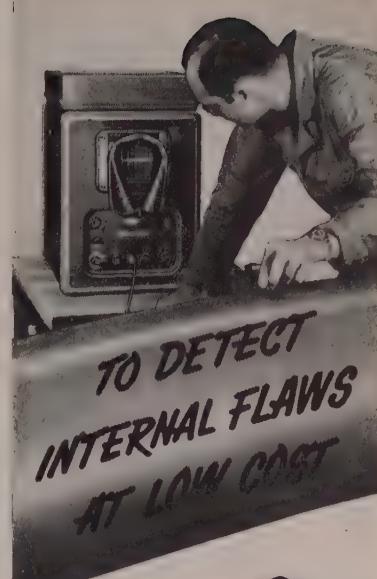
Due to sensitivity of components used in the production of Lear instrument products, it is necessary to remove every trace of moisture, even to the extent of the minute quantity found in and on the metal being used. Condensation in instruments at high altitudes and low temperatures may cause the vital aircraft instruments to become inaccurate or inoperative.

Additional details on industrial and commercial application of sub-zero temperatures are available on request to Sub-Zero Products Division, Deepfreeze Distributing Corp., Reading Rd., Cincinnati 29.

New Motor Bulletin Offered

Construction features of Allis-Chalmers large end-shield bearing squirrel-cage induction motors are described in a new bulletin. Built for a wide range of applications from central station auxiliary to general industrial drives, these motors are available in ratings and speeds up to 1750 hp at 1800 rpm.

Construction features of these motors, according to the producer, include welded stator yoke, long-life stator winding, capsule-type housings, split sleeve bearings, air-gap access holes, silver-brazed cage, protecting end shields, large discharge openings,

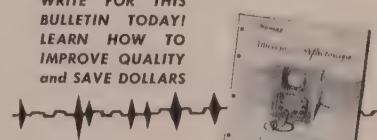


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Ultrasonic REFLECTOSCOPE

TEST NEW MATERIAL at the mill to improve quality and customer acceptance. TEST METALS PRIOR TO PROCESSING, MACHINING AND FABRICATING to avoid wasted machine time and man-hours resulting from faulty materials. QUALITY CONTROL of work in process. MAINTENANCE INSPECTION to detect fatigue fractures. MEASURE PHYSICAL DIMENSIONS. Rely on the ultrasonic Reflectoscope to provide accurate inspection-instantaneously at low cost. Reflectoscopes are available for sale, for rent or lease.

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LEARN HOW TO
IMPROVE QUALITY
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COUPLINGS, HYDRAULIC CONTROLS
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HERC- ALLOY SLING CHAINS

HERC-ALLOY FEATURES

- America's first alloy steel sling chain...first to bear a serial number.
- Every CM HERC-ALLOY Sling Chain is alloy steel throughout...links, rings, hooks. There is only one grade...the best.
- Every chain is individually tested and accompanied by a certificate of registration.
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- HERC-ALLOY Chains should never be annealed.
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● A simple visual inspection* is all that is needed to determine the continued serviceability of a HERC-ALLOY Chain. That's why more and more of the important companies are standardizing on HERC-ALLOY...because HERC-ALLOY Chains are immune to unseen dangerous crystallization...because you can see when a HERC-ALLOY Chain needs repairs or replacing.



*Write for your copy of this new, informative booklet. No charge.

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CHAIN CORPORATION

(Affiliated with Chisholm-Moore Hoist Corporation)

GENERAL OFFICES AND FACTORIES: TONAWANDA, N. Y.
SALES OFFICES: New York • Chicago • Cleveland • San Francisco • Los Angeles

and inherently drip-proof design.

Motors can be had with special electrical modifications to suit application requirements. Although sleeve bearings are standard, motors may be obtained with capsule-type antifriction bearings whenever the speed and application are suitable. Numerous other mechanical modifications, such as double shaft extension or three-bearing construction, are also available. Terminal boxes for all leads are standard for many ratings and can be added for all ratings.

Copies are available upon request from the company, 1021 S. 70th St., Milwaukee.

Furnace Loading Time Slashed

Mechanized materials handling has reduced the loading time on five annealing furnaces from all day to 2 hours at Fafnir Bearing Co., New Britain, Conn. Fafnir produces bearings, ranging from three-eighths of an inch to 19 inches in diameter, which are used in almost every type of machine from adding machines to zipper makers. Floor space in the four Fafnir plants in New Britain totals nearly 19 acres in four and six-story buildings.

Fafnir uses its materials handling equipment in both standard and unusual ways. Virtually all parts are carried by fork lift or platform trucks at some stage of production. Trucks used for this purpose include 2000 - pound capacity electric-powered Automatic fork trucks, equipped with rollover forks, and platform-type driver-led Transporters, all made by Automatic Transportation Co., Chicago.

Typical operations include intra-departmental runs of from 200 to 600 feet with bins of partly finished products. This operation, the user reports, has saved a high percentage of handling costs.

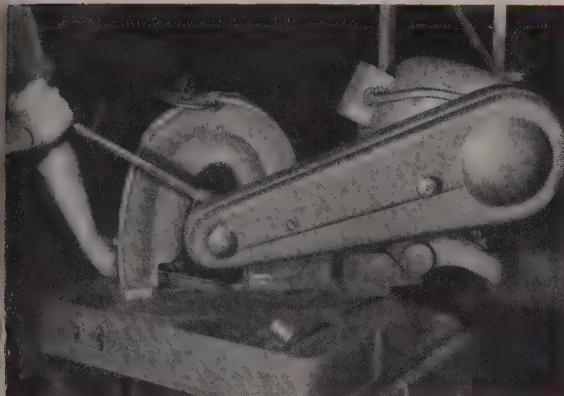
A "let's try it" attitude is prevalent throughout the plant. Their method of loading the annealing furnaces with forged rings or hoods in cast-iron bins is part of this. The fork truck takes the bins and places them three-in-a-row on the furnace car, which the fork truck then pushes into the furnace.

Another problem solved by mechanical methods is chip and scrap handling. Here, Automatic's rollover forks are employed to dump the entire load directly into bins or highway trucks. This technique produced a considerable saving in handling, and the fork truck paid for itself in less than a year.

In Fafnir's Washington street plant one Transporter is used for several floors. A small elevator pro-

3 TESTED WAYS

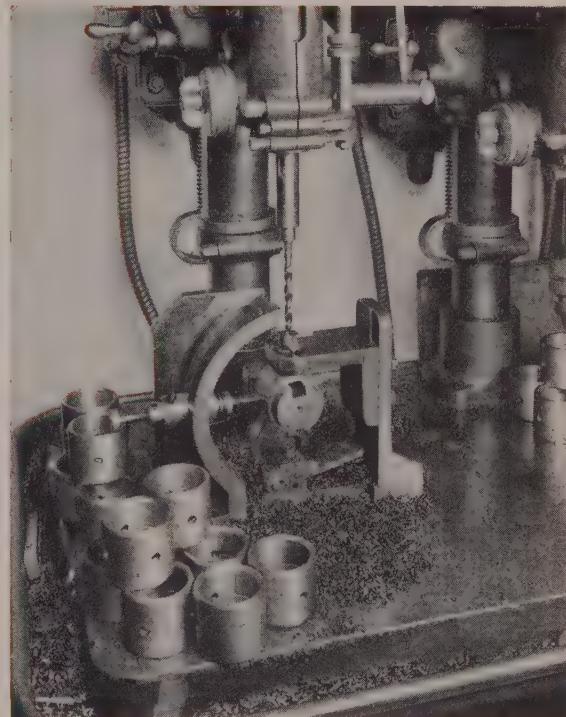
to Save Time, Space or Handling with DELTA Tools



Automotive moulding cut-off speeded 1000%

FOUR WHEEL DRIVE AUTO COMPANY . . .

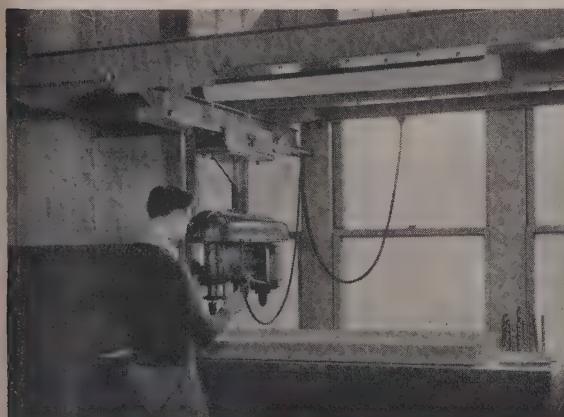
Clintonville, Wis. All metal moulding used for truck cabs is cut on Delta abrasive wheel cut-off machine, with ten times faster production. Previous hand cutting methods entailed great operator fatigue and required a deburring operation. Delta cut-off machines are also available with saw blades for non-ferrous work.



With one fixture, Delta drill press handles 57 different parts—REED-PRENTICE CORP. . . .

Worcester, Mass. A single ingenious jig, easily and quickly adjustable, is used to drill equally spaced holes in 57 different parts, with a big saving in tool storage space and manufacturing time. An arbor-holding bracket is adjustable horizontally and vertically, and an indexing pin in a double quadrant, inserted in the first hole drilled, locates the next hole accurately.

Delta users originate many unique and practical applications because Delta tools are so adaptable to so many jobs. Your Delta dealer will help you fit them to your own machining requirements. He's listed in the classified section of your phone book —under "Tools."



Overhead mounting for Delta drill press reduces handling of bulky panels

KIRKHOFF ELECTRIC CO. . . . Grand Rapids, Mich.

With an overhead crane mounting, a Delta 17-inch drill press will drill holes in any location on 36" x 96" switchboard panels without moving the panels. Both the drill head and bridge are suspended from ball bearings riding on flat cold rolled bars; and the whole framework is supported from the building steel structure for a clear field of operation. Panels are 1½" ebony asbestos or ½" steel.

There's a Delta Power Tool for your job—
WOOD OR METAL WORKING

53 MACHINES — 246 MODELS — MORE THAN 1300 ACCESSORIES



DELTA POWER TOOL DIVISION

Rockwell MANUFACTURING COMPANY

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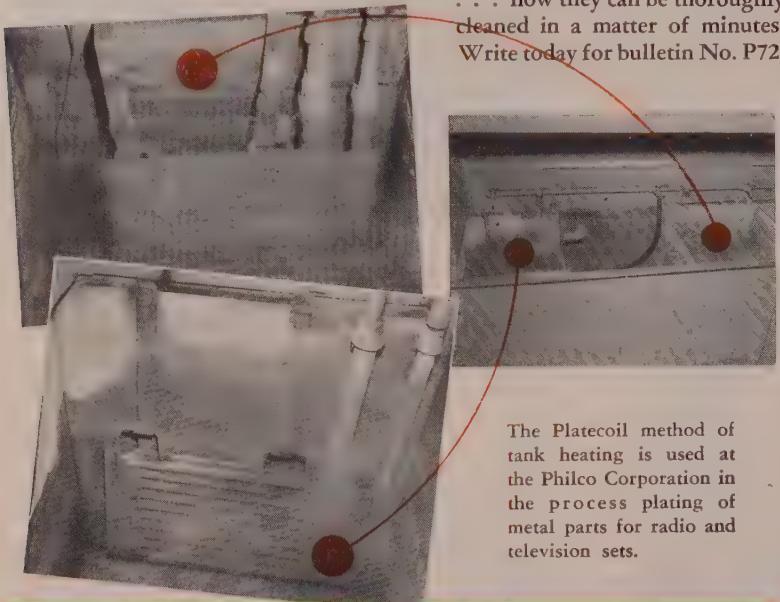
PHILCO finds

“platecoils have better heat conductivity than any similar coil”

being used by the Philco Corporation of Philadelphia in the process plating of metal parts for radio and television sets. Although the Platecoils haven't been used very long, Philco production officials say they are "most pleased with the results that have been thus far obtained." They've found that, at least in their operation, the Platecoils are self cleaning . . . which saves many hours of maintenance time. They've found, too, that Platecoils have a much higher rate of heat conductivity . . . which means faster tank heating.

Platecoils have a greater BTU transfer because they have more prime surface in a given area. A 22"x47" Platecoil gives the same heat transfer surface as 32 ft. of 1½" pipe. Thus Platecoil saves about 50% over equivalent pipe coil. Think what this means to you in lower initial cost, lower installation and handling costs.

Learn too, how Platecoils can be replaced without dumping the tank solution . . . how they can be thoroughly cleaned in a matter of minutes. Write today for bulletin No. P72.



The Platecoil method of tank heating is used at the Philco Corporation in the process plating of metal parts for radio and television sets.

PLATECOIL gives you these ADVANTAGES

- Cleaned and Repaired Without Dumping Tank Solution
- Greater BTU Transfer Per Unit Area
- Weighs Only Half as Much as Pipe Coil
- No Threaded Joints in Tank
- Increased Tank Capacity
- Fast, Easy Installation
- Easy to Clean

See us at the METAL SHOW—BOOTH G-345



vided a bottleneck, but the unit was able to ride the elevator with its load and deliver it on any floor. The transportation maintenance foreman says that this was the only solution to the problem of mechanizing materials handling within the building.

Aluminum Automotive History

You've probably seen a lot of information in print recently about General Motor's exciting "car of the future" called Le Sabre. This 1960 dreamboat is largely made of light-weight aluminum and magnesium—except for a few chassis parts.

The idea of aluminum automobiles is wonderful but not at all new. In the early days of the automotive industry Europeans promoted the aluminum car. Cars over there were taxed partly on their weight; and owners expected to drive them for 10 or 12 years. Europeans said that cars with an aluminum body used less gasoline, wore out fewer tires and lasted longer.

In America during 1903 aluminum bodies appeared in such cars as the White, Peerless, Pope-Toledo and White Steamer, Pierce-Arrow, Duesenberg, Franklin and Jordan also adopted the aluminum body.

During the 1920s Aluminum Co. of America decided to build all-aluminum cars. Altogether, they designed and constructed 15 aluminum cars (actually they were 85 per cent aluminum)—11 six-cylinder and 4 four-cylinder jobs, plus one extra chassis. These first cars, like the aluminum car of today, were experimental. But one clicked off 120,000 miles.

Aluminum cars, lighter than standard models by nearly 1000 pounds, were built at three Alcoa plants. Not only were the bodies made of aluminum but so were the frame, gasoline tank, spring brackets and hangers, steering gear housing, steering gear levers, tie rod and drag link, brake levers, front axle beam, rear axle housing, brake shoe supports, brake drums, wheels with integral hubs, radiator shell, fenders and splash pans, cylinder block, crankcase, cylinder head, intake manifold, timing gear cover, oil pan, pistons, connecting rods, oil pump, clutch cover, transmission case and torque tube and hound rods.

But just as prospects looked good, low cost steel sheets came into the picture and temporarily relegated the aluminum car body to the museum. Steel sheets were rolled wide enough so that only one stamping operation was needed instead of a number of different operations. Consequently



In your process...

HOW HOT IS HOT?

To meet the requirements of today's high-temperature processes, ALCOA Aluminas are helping refractory manufacturers revise our concept of "how hot is hot." Operating temperatures that were once inconceivable are common today. Yet new processes and speeded production are pushing even those temperatures higher and higher.

Modern operators are using refractories fortified with ALCOA Alumina to increase the output of their metallurgical furnaces, chemical processing kilns, glass tanks and other high-temperature equipment. They know that these refractories *considerably reduce down time!* And down time costs more than good refractories.

Even at moderate temperatures, a *little* ALCOA Alumina in refractories makes a marked difference, but the higher the alumina content, *the better the performance*. Strength and stability are improved . . . resistance to spalling, abrasion and fluxing is increased . . . thermal and mechanical shock resistance is improved. Such refractories are being successfully used up to 3650° F.

Perhaps refractories fortified with ALCOA Alumina are the answer to *your* extra high-temperature requirements. Let us discuss them with you. We'll gladly refer you to reliable sources of supply. Write to: ALUMINUM COMPANY OF AMERICA, CHEMICALS DIVISION, 622J Gulf Building, Pittsburgh 19, Pennsylvania.

Alcoa Chemicals



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ACTIVATED ALUMINAS • CALCINED ALUMINAS • HYDRATED ALUMINAS • TABULAR ALUMINAS • LOW SODA ALUMINAS
ALUMINUM FLUORIDE • SODIUM FLUORIDE • SODIUM ACID FLUORIDE • FLUOBORIC ACID • CRYOLITE • GALLIUM

FULL SPEED AHEAD

IS THE
PRESENT-DAY
DEMAND

and You Can
Command It With

D.P.S. MOTORIZED
Selective Feeding

HOPPER UNITS

Modern production methods demand more speed and accuracy in the selection and feeding of parts than can be accomplished by hand . . . Our 25 years experience as pioneers in the assembly field enables us to ably meet this demand with the D.P.S. Motorized Hopper Units, the outstanding selective feeding devices with which production parts of a wide variety are selected, oriented and fed in a given position for primary and secondary operations . . . They are a completely self-contained unit, including drive and feed track. They are easily adaptable to presses, centerless grinders, thread rolling and slotting machines, also special machines . . . Six sizes, 8", 10", 12", 16", 24" and 30" diameters for handling various sizes of parts. No matter what your feeding problem is, we can meet your requirements. Designers of special equipment will also be interested.

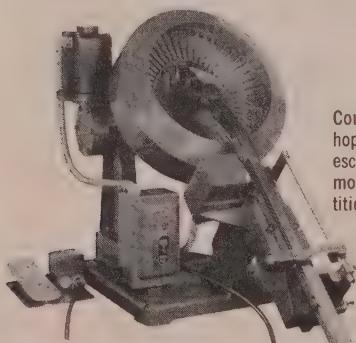


Hopper feeding 30 caliber shell discs, concave side up, to press for drawing operations.



Sixteen-inch hopper mounted on tapping machine equipped with air-operated dial—completely automatic operation.

Send for further details, also information about D.P.S. Power Screwdrivers, Nut Drivers and Special Assembling Machines.



Counting and feeding hopper with adjustable escapement to accommodate varying quantities.



DETROIT POWER SCREWDRIVER CO.

2811 W. FORT ST.

DETROIT 16, MICHIGAN

price ruled out the aluminum mode

One of Alcoa's aluminum automobiles now is a show piece at the Daimler Ltd. Museum, in England. Another is in Henry Ford's Greenfield Village at Dearborn, Mich. Several other aluminum cars, long used at Alcoa's Cleveland plant as courtesy cars for visitors, were retired in the early 1930s. Though the aluminum body was discarded, dozens of other parts are today produced of aluminum. Millions of parts and millions of pounds of aluminum have since poured into the automotive industry each year.

Induction Heater Ups Output

Induction heating at De Lava Steam Turbine Co. has cut coupling bolt hardening costs 70 per cent according to S. P. Felix, superintendent of the company's Standard Products Division.

Used for hardening bolts after machining, the induction heat process also gives them correct hardness and distortion-free properties, he said.

"We formerly had to harden a piece first, then machine it. But now, with induction heating, we can finish machine it, then harden it. The result is as distortion-free as if we had machined it after hardening. This has eliminated two operations".

"Lead time" on the hardening operation has been cut from three days to a few hours on a given batch. Formerly, they had to heat furnaces for small runs, or hold jobs until enough pieces had accumulated to justify a run. This slowed down production and increased "lead time".

According to Mr. Felix, DeLava installed the General Electric heater "in order to reduce the number of operations, which in turn would decrease our costs." He also emphasized that use of induction heating gives them better control of heating depth, which determines the quality of each piece.

Core Bulletin Offered

A new 12-page engineering bulletin illustrated with graphs demonstrating behavior characteristics of each of its three grades of metallic oxide Ceramag cores under varying conditions of permeability, flux density, temperature, and other magnetic properties is available by request on your letterhead to Stackpole Carbon Co., Somers, Pa.

These nonmetallic cores have found wide-spread use in TV flyback transformers, deflection yokes, image width controls and other applications where high permeability for relatively low flux densities and medium fr

encies is required. Particularly valuable for the design engineer, the bulletin will suggest many new ways of lowering costs and raising efficiency of modern electronic equipment.

Reflow Line Moves at 2500 Fpm

Tin plate moving at 2500 feet per minute is heated to the melting point of the tin in less than one-quarter second by 1800 kilowatts of radio-frequency power on the No. 4 electrolytic tin plate line at Weirton Steel Co., Weirton, W. Va. The high



RF HEAT WORKS AT HIGH SPEED ... 1800 watts do the job in 5½ feet

frequency tin reflow equipment was designed and built by Westinghouse Electric Corp., Pittsburgh.

Five induction coils in the tower are used to transfer power to the strip. The active heating zone is only 5½ feet long, being equal to the length of the five coils.

Power density is as high as 400 kw per lineal foot of tin plate. It is great enough to produce a sharp line of demarcation across the material at the melting point of the tin, called the flow line. Use is made of this flow line to hold constant the temperature to which the tin plate is heated.

Offers Die Setting Manual

Cerro de Pasco Corp. (formerly Cerro de Pasco Copper Corp.) has just released a 20 - page illustrated manual describing their Cerromatrix method of punch and die setting. It is filled with practical information regarding application of the method of making various types of dies. Copies are available on request from 40 Wall St., New York.



here's the surest way OF APPRAISING FIRE PROTECTION

SERVICE

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SAVINGS

TO be best evaluated, fire protection must be considered in the light of known results . . . results that when honestly measured, are evidenced in the qualities of *Assured Service* . . . *Approved Safety* . . . and *Accepted Savings*.

From a Service point of view, *Automatic Sprinklers* stand on their record of past performance . . . safeguarding commercial and industrial enterprise from fire for over half a century . . . extinguishing small fires at their inception before major conflagrations can develop.

Automatic Sprinklers record of approved Safety is attested in the reports of all leading insurance authorities.

The fact that the cost of *Automatic Sprinkler* protection at Buhl Sons Company, Detroit, Michigan, will be paid for by means of reduced insurance rates in about 15 years (nearly 7% per annum), substantiates their acceptance as *Savings*.

You will find it wise to plan adequate fire protection for your business property now, and in that planning give careful consideration to those qualities of Service . . . Safety . . . and Savings. *Automatic Sprinklers* continue to offer all three. They're an important investment today . . . perhaps welcomed protection tomorrow.

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TYPICAL *Automatic Sprinkler* PROTECTED PROPERTIES
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DEVELOPMENT • ENGINEERING MANUFACTURE • INSTALLATION
OFFICES IN PRINCIPAL CITIES OF NORTH AND SOUTH AMERICA

CALENDAR OF MEETINGS

† Denotes first listing in this column.

September 14-16, American Society of Sanitary Engineering: National convention, Hotel Statler, Detroit. Society address: 1308 Freemont St., McKeesport, Pa. Secretary: T. M. Dugan.

September 16-19, American Institute of Chemical Engineers: National meeting, Hotel Sheraton, Rochester, N. Y. Institute address: 120 E. 41st St., New York 17. Executive secretary: Stephen L. Tyler.

September 17-19, Allied Railway Supply Association: Fall meeting and exhibit, Hotel Sherman, Chicago. Association address: Box

5522, Chicago 80. Secretary: Charles F. Weil.

September 21-23, National Association of Waste Material Dealers Inc.: Fall meeting, Saranac Inn, Upper Saranac Lake, N. Y. Association address: 1109 Times Bldg., New York 18. Secretary: Clinton M. White.

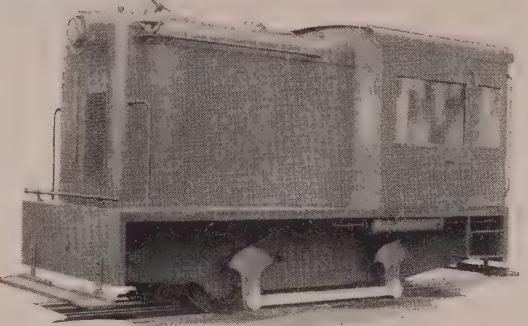
September 21-25, Steel Founders Society of America: Fall meeting, The Homestead, Hot Springs, Va. Society address: 920 Midland Bldg., Cleveland 15. Secretary: F. Kermit Donaldson.

September 24-25, American Coke & Coal Chemicals Association: Annual fall meeting, Skytop Lodge, Skytop, Pa. Association address: 711 14th St. NW, Washington. Executive secretary: Samuel Weiss.

September 24-26, National Truck Body Mfrs. & Distributors Association: Annual convention and suppliers exhibit, Chalfonte-Haddon Hall, Atlantic City, N. J. Association address: 346 Connecticut Ave. NW, Washington. Secretary-manager: Shipley D. Burton.

For Faithful and Profitable Performance CHOOSE a DAVENPORT

At right is a 20-Ton, 24" Gauge, 0-4-0 Davenport Diesel Locomotive with Torque Converter Drive, engine rated at 153 h. p. at 1800 r. p. m.



Davenport Locomotives with Torque Converter drive are obtainable in a range of sizes, with either Diesel or Gasoline power. They offer smooth, quiet transition from one speed level to another; absence of engine slowdown during speed changes, freedom from transmission of load shocks or jerks; assure easier operation and greater work output.



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You will obtain best results from FITTED POWER. Davenport engineers will be glad to receive a description of your operating conditions and haulage work to be done. They will analyze such data and, without obligation on your part, will recommend the locomotive best suited to deliver maximum work at lowest ton-mile costs.

Complete Information on Request

DAVENPORT LOCOMOTIVE Division
DAVENPORT BESLER CORPORATION
DAVENPORT, IOWA, U.S.A.

EXPORT OFFICE

50 CHURCH STREET, NEW YORK 7

CABLE ADDRESS "BROSITES"

September 25-28, American Society of Mechanical Engineers: Fall meeting, Hotel Radisson Minneapolis. Society address: 29 W. 39th St., New York. Secretary: C. E. Davies.

September 26-29, Marking Device Association: National convention, Edgewater Beach Hotel, Chicago. Association address: 134 N La Salle St., Chicago. General manager E. F. Way.

September 27-30, Multiple V-Belt Drive & Mechanical Power Transmission Association: Annual meeting, The Broadmoor, Colorado Springs, Colo. Association address: 7 W. Madison St., Chicago 2. Executive secretary: Harry P. Dolan.

OCTOBER

October 1-2, American Machine Tool Distributors Association: Annual meeting, Chalfonte-Haddon Hall, Atlantic City, N. J. Association address: 1900 Arch St., Philadelphia. Executive secretary: Thomas A. Fernley Jr.

October 1-4, Association of Iron & Steel Engineers: Fall meeting, Sherman Hotel, Chicago. Association address: 1010 Empire Bldg., Pittsburgh. Managing director: T. V. Ess.

October 2-4, Society of Industrial Packaging & Materials Handling Engineers: Exposition and "short course," Hotel Cleveland, Cleveland. Society address: 20 W. Jackson Blvd., Chicago. Secretary: H. E. Brill.

October 3-5, Pressed Metal Institute: Fall meeting, Drake Hotel, Chicago. Institute address: 13210 Shaker Square, Cleveland 20. Managing director: Orrin B. Werntz.

October 8-12, National Hardware Show: Grand Central Palace, Atlantic City, N. J. Managing director: Frank Yeager.

October 8-13, Concrete Reinforcing Steel Institute: Fall meeting, Grove Park Inn, Asheville, N. C. Institute address: 38 S. Dearborn St., Chicago 3. Managing director: H. C. Delzell.

October 9-12, The Electrochemical Society Inc.: Centennial—Fall convention, Hotel Statler, Detroit. Society address: 235 W. 102nd St., New York 25. Secretary: Henry B. Linford.

October 10-12, Porcelain Enamel Institute Inc.: Shop practices forum, Deshler-Wallace Hotel, Columbus, O. Institute address: 1010 Vermont Ave. NW, Washington. Secretary: Edward Mackaser.

October 11, American Iron & Steel Institute: Regional technical meeting, Hotel Warwick, Philadelphia. Institute address: 350 Fifth Ave., New York. President: Walter S. Tower.

October 12-14, Metal Treating Institute: Annual meeting, Detroit. Institute address: 271 North Ave., New Rochelle, N. Y. Executive secretary: C. E. Herington.

October 13-14, American Welding Society: Annual meeting, Book-Cadillac Hotel, Detroit. Society address: 33 W. 39th St., New York 18. Secretary: J. G. Magrath.

October 13-14, American Society for Metals: Annual seminar, Hotel Statler, Detroit. Society address: 7301 Euclid Ave., Cleveland. Secretary: W. H. Eisenman.

October 13-17, Packing Machinery Manufacturers Institute: Fall meeting, Mid Pines Club, Southern Pines, N. C. Institute address: 342 Madison Ave., New York 17. Secretary: Helen L. Stratton.

October 14-18, American Hardware Manufacturers Association: Fall meeting, Marborough-Blenheim Hotel, Atlantic City, N. J. Association address: 342 Madison Ave., New York 17. Secretary: Arthur L. Faubel.

October 15-17, American Gas Association: Annual meeting, Kiel Auditorium, St. Louis. Association address: 420 Lexington Ave., New York 18. Secretary: Kurwin R. Boyes.

October 15-19, American Society for Metals: National Metal Congress & Exposition, Statler Hotel, Detroit and Michigan State Fairgrounds. Society address: 7301 Euclid Ave., Cleveland. Secretary: W. H. Eisenman.

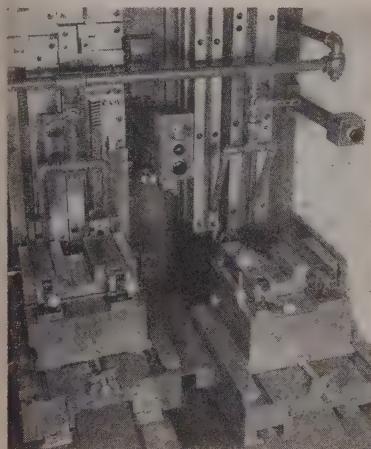
October 15-19, The World Metallurgical Congress: Hotel Statler, Detroit. Sponsored by American Society for Metals. Manager: W. H. Eisenman; director: Dr. Zay Jeffries.

October 16-19, Scientific Apparatus Makers Association: Record controller & midyear (Continued on p. 138)

New Products and Equipment

Vertical Broach Improved

Improvements in its duplex vertical hydro-broach machine are announced by Cincinnati Milling Machine Co., Cincinnati 9, O. Built in 5 and 10-ton sizes, a 42 or 54-inch stroke can be furnished on the smaller model and a 54 or 66-inch stroke on the larger. Chief design improvement is in the table construction. Rams operate alternately up and down, cutting on the down



stroke. In front of each ram an individual table advances to cutting position and retracts to leading position, synchronized with the movement of the rams.

Protection of the hydraulic pump and valves is provided through fine mesh intake strainers and an efficient filter connected in parallel to the hydraulic circuit. A pressure gage indicates to the operator when the filter is becoming clogged and should be replaced. Preset cycle control, a safety feature formerly supplied as an attachment is now included with the standard machine equipment.

Check No. 1 on Reply Card for more Details

Large Steam Output

Vapor Heating Corp., 4501 W. 16th St., Chicago, Ill., announces its steam generator model 4740 for supplying large quantities of high-pressure dry steam. The unit develops 200 pounds steam pressure in 2 minutes from cold water and produces 4800 pounds of 99 per cent dry steam per hour at 82 per cent efficiency. Forced draft air and pressure atomized fire releases a million Btu's per cubic foot of combustion space. One electric motor (or gasoline engine on portable units) drives the water pump, fuel pump, blower and mag-

neto. Once started the machine operates automatically and steam pressure may be changed from 75 to 600 psi by turning one control.

A servo control automatically modulates the machine to produce from one-third to full capacity. Safety controls such as steam temperatures limit control, stack temperature cut-out, safety valves, electric flame control, time delay relays and others have been incorporated into this machine. Overall size of the package unit is 52 inches wide, 76 inches long and 78 inches high.

Check No. 2 on Reply Card for more Details

Multiple Inspection

Multi-dimension inspection machine made in England by Sigma Instrument Co. Ltd., is being introduced in the U. S. by Cosa Corp., 405 Lexington Ave., New York 17, N. Y. Designed for 100 per cent inspection, machine checks simultaneously for inside and outside diameters, depths, profiles, tapers, concentricity, etc. In-



spection results are shown by signal lights on a panel: Within limits, a master green light; on the plus side, a yellow light for each dimension; and on the minus side, a red light for each dimension. As many as 28 dimensions of a turbine blade can be inspected simultaneously at 300 pieces per hour.

Available for hand, semiautomatic or fully automatic operations, the machine is made up of standard units. Tips of the measuring gages, work holders and loading magazines or hoppers are the only special parts required for individual setups.

Check No. 3 on Reply Card for more Details

Fan-Cooled Enclosed Motors

Tri-Clad line of single-phase capacitor motors has been extended to include a totally enclosed fan-cooled construction according to an announcement by Small and Medium

Motor Divisions, General Electric Co., Schenectady 5, N. Y. Available in ratings of 1, 1½, 2, 3 and 5 hp, the new line was developed for use where extra severe conditions of dirt, grit or moisture are encountered. It is also offered in explosion proof and dust-explosion proof construction for installation in hazardous locations.

Motors have cast aluminum squirrel-cage rotors and are equipped with long-life ball bearings which will run for years without attention. Except for the 5-hp size, which uses 230 v only, the new motors operate on 115/230-volt, 60 cycle power supply. Check No. 4 on Reply Card for more Details

Stress Relieving Oven

Announcement is made by Grieve-Hendry Co. Inc., 1101 N. Paulina St., Chicago 22, Ill., of a portable electric oven model HT for processing at higher temperatures such as required for stress relief of springs and plated parts. Construction permits the nesting of one oven on top of another. They can be used in groups or banks and can be operated individually or selected ovens in the group can be



cut out or heated at different temperatures.

Temperature range is 100 to 800° F. Construction is heavy gage steel with Fiberglas insulation. No special wiring is required as oven operates from any 110 v outlet. Inside dimensions are 22 inches wide by 18 inches deep by 16 inches high.

Check No. 5 on Reply Card for more Details

Divided Platform for Truck

A low-lift platform-type power truck with platform built in two sections is a development of Elwell-Parker Electric Co., 4205 St. Clair Ave., Cleveland 3, O. Designed to meet special requirements as well as serving as an ordinary platform truck in handling standard skids and tote boxes, the truck has a divided forward trail axle with each of two



IT'S ALL 'IN THE HEAD'

which is a **© Special!**

The heads of these special bolts have a built-in determination to resist rotation within the molded rubber product encasing them. This extra holding power is all in the head—precision formed on our modern cold-heading machinery. Even though never seen by the customer, this bolt serves him well doing a special job of bonding the strength of steel with the resilience of rubber.



THIS **©
MASSAGE CUP
BOLT** is typical of
many molded-in-rubber
applications in which the
life of the product depends
upon a special **©** Bolt

APPLICATIONS Similar applications of rubber encased bolt heads are found in cushion mounts, automotive bumpers, vacuum cups, motor mountings, shockless suspensions and in track pads.

We have a "Special" answer
FOR EVERY "SPECIAL" PROBLEM

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wheels having a separate axle mounted in its individual frame. The two parallel frames are strongly built, reinforced and welded to the truck body. Platforms are joined at their rear ends in a rigid structure, enabling them to be raised or lowered simultaneously. Forward ends are connected to the wheel frames by forged steel links and the platforms retract as they are raised.

Platforms are formed of heavy gage steel plate with deep flanges for extra strength. In lowered position the flanges come down at the



sides of the wheel frames. Platforms are 6-3/4 inches wide, 63 inches long, placed 14 inches apart. Lowered they are 10½ inches above floor and maximum height is 15 inches. These trucks are powered all-electric or gas-electric and capacities are 2000, 4000 and 6000 pounds.

Check No. 6 on Reply Card for more Details

Barrier Material Slitter

Model BL sheeter made by Miller Wrapping & Sealing Machine Co., 18 S. Clinton St., Chicago 6, Ill., provides a high speed means of slitting and cutting sheets of barrier material, particularly grade C, type I from rolls. Machine readily cuts the wrapping material although it has a tackiness caused by its waxy coating and its toughness.

A special provision prevents the tacky material from sticking to cut-off knife. Trip levers can be locked in "on" position for continuous action or manually tripped for each cut. Slitters can cut up to six sheets at a time with each knife stroke at a rate 12 to 36 cuts per minute.

Check No. 7 on Reply Card for more Details

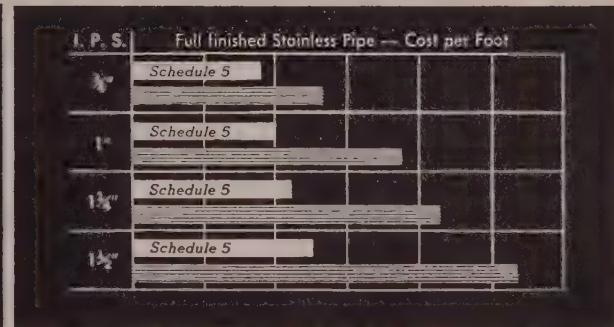
Air Pollution Detector

Thomas Autometer for detecting air pollution by sulphur dioxide, made by Leeds & Northrup Co., 4934 Stenton Ave., Philadelphia 44, Pa., is available as either an integrating or nonintegrating assembly with Speedomax electronic recorder. Integrating unit continuously records actual concentration of sulphur dioxide in parts per million, records average concentration integrated over a half hour



how Carpenter is helping industry get more stainless pipe

— even today, when it's tough to get!



Comparison of costs with Schedule 40 shows savings of 10% to 45% with Schedule 5. Additional savings on costs for valves, fittings, etc. are also possible.

What Carpenter Schedule 5 Pipe Is—

Its LIGHT WALL gives more feet of pipe for every pound of Stainless Steel. Cost is 40% to 50% lower. Larger I.D. increases flow area and permits use of a smaller pipe size.

You now have a way to help us improve the availability of Stainless Pipe for essential uses. And you can do it at a terrific saving in your costs.

You can hook up Schedule 5 Pipe with existing lines of tubing or heavier wall pipe, Schedules 10 and 40.

For most jobs Carpenter Schedule 5 Stainless Pipe handles the working pressures with a good margin of safety. Any working pressure up to 150 psi is handled by this pipe. In pipe sizes under 1 1/2", higher pressures are frequently used.

More Stainless Pipe for essential uses is possible, even under today's conditions. To get the full story, call your nearest Carpenter Stainless Tubing Distributor. Or, write for a copy of the new "Schedule 5 Data Sheets". We will be glad to send you a set.



THE CARPENTER STEEL COMPANY
Alloy Tube Division, Union, N.J.

Export Department: Carpenter Steel Co., Reading, Pa.—"CARSTEELCO"



Carpenter

STAINLESS TUBING & PIPE



• guaranteed on every shipment

TREET-ALL

**the
HEVI-DUTY
Multi Purpose
FURNACE
for
TOOL ROOM AND
EXPERIMENTAL HEAT TREATING**

WITH a maximum temperature of 1850° F., the TREET-ALL can easily handle your scale free hardening, carburizing, dry cyaniding and silver brazing. The alloy muffle and gasketed door form a tight seal which simplifies atmosphere control. For hardening, an atmosphere generator is not necessary; raw gases, such as bottled or natural gas, can be used to provide the atmosphere. The furnace, quench tank, cabinet and controls form a compact, completely wired unit.



TREET-ALL furnaces are built in 3.6 KW and 8 KW sizes with inside muffle dimensions of 7" W x 15" L x 4-7/8" H and 10" W x 18" L x 7 1/2" H respectively.

Write for Bulletin HD-1147-BB

HEVI DUTY ELECTRIC COMPANY
HEAT TREATING FURNACES **HEVI-DUTY** ELECTRIC EXCLUSIVELY
DRY TYPE TRANSFORMERS — CONSTANT CURRENT REGULATORS
MILWAUKEE 1, WISCONSIN

period, automatically checks its zero reading every 30 minutes and marks off each cubic foot of air sampled. The nonintegrating assembly is of simpler design providing only continuous concentration record.

Range of the equipment, 0 to 5 parts of SO_2 per million, covers concentrations which are of interest in pollution surveys. Changes in concentration as small as a few tenths of a part per million can be readily detected.

Check No. 8 on Reply Card for more Details

Hydraulic Pressure Riveter

Manco Mfg. Co., Bradley, Ill., has developed a unit called the Guillotine Riveteer for driving rivets with hydraulic pressure. A squeezing action is utilized rather than the customary hammering of the rivet head. The unit delivers 60,000 pounds thrust through the hydraulic ram and will drive 5/8-inch cold rivets. Entire



riveting cycle on the portable unit takes 2 1/2 seconds. Operator presses the hand valve to actuate the ram; release of the valve provides automatic retraction.

Full thrust is delivered over the entire stroke and no adjustment is needed between different length rivets. Unit is also relatively quiet in operation. Little or no maintenance is required and specially designed oil seals prevent leakage both at maximum pressure and at no pressure. Companies desiring to design their own C frame may obtain the unit without the frame.

Check No. 9 on Reply Card for more Details

Dual-Channel Oscilloscope

Model H-23 dual-channel oscilloscope announced by Electronic Tube Corp., Philadelphia 18, Pa., features a flat frequency response from direct current to 1 megacycle. Use of two independent channels working into a single two-gun cathode ray tube permits high or low frequency phenom-

QUALITY ALL THE WAY THROUGH

WEIRITE

HOT-DIP AND ELECTROLYTIC
TIN PLATE, TIN MILL BLACK PLATE

WEIRZIN

ELECTROLYTIC ZINC-COATED
SHEETS AND STRIP

WEIRTON

HIGH-CARBON STRIP
COLD-ROLLED SPRING STEEL

WEIRALEAD

LEAD ALLOY COATED SHEETS
AND LONG TERNE SHEETS

WEIRCOLOY

GALVANIZED SHEETS

N-A-X

HIGH-TENSILE
LOW-ALLOY STEELS

Lacquered and Coated Products • Tie Plates • Structural • Bars • Piling
Hot-Rolled Sheets and Strip • Cold-Rolled Sheets and Strip • Angles

WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA

NATIONAL STEEL



CORPORATION

ena to be viewed either singly or simultaneously on a single tube face.

Vertical deflection amplifiers have capacitive and conductive input attenuators allowing operation as either ac or dc coupled amplifiers. Each channel is supplied with an independently operating sweep generator. Both channels may be switched to the same sweep, allowing the examination of two related phenomena on a common time base. Sweep generators are designed for either single sweep or recurrent operation.

Check No. 10 on Reply Card for more Details

Press for Light Work

Micro press is the first of a line of tools for instrument and small parts production announced by Metalix Mfg. Co., 26 Fitch St., Norwalk, Conn. It is a small, versatile press for light duty precision operation in



staking, punching, piercing, reaming, broaching, marking, forming and riveting. Tools are guided by an adjustable cross arm mounted on a tool steel column.

Standard adjustable fixture plate mounted on the base is hardened and lapped for accuracy, and contains 21 holes ranging from 0.013 to 0.185-inch in diameter. Clearance between the fixture plate and cross arm is adjustable up to 1 1/4 inches. Standard models are provided with a hand press lever. A special model with micrometer step depth adjustment is also offered.

Check No. 11 on Reply Card for more Details

Accurate Trailer Spotting

A motorized tractor that automatically engages various type of industrial trailers permitting operation in narrow aisles and accurate spotting of loaded trailers is announced by

Greater Tonnage
Per Edge of Blade



AMERICAN
SHEAR KNIFE CO.
HOMESTEAD - PENNSYLVANIA

LET OAKITE
SOLVENT DETERGENTS
DO YOUR HEAVY
CLEANING

DO YOU KNOW

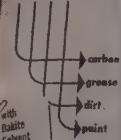
THEIR 9 BIG

ADVANTAGES?

See page 7 ► ► ►

FACTS

about removing



OAKITE PRODUCTS, INC.

This new
FREE booklet on
Solvent Detergents

TELLS HOW two new types of Oakite-developed cleaners make it easier and cheaper for you to do many difficult metal-cleaning jobs. Here are some of the subjects covered in the booklet:

Cleaning-action of solvent-detergents

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Cleaning metal between processing operations

Precleaning before painting or plating

Stripping paint

Providing temporary protection against rust

How to use Oakite solvent detergents:

Spray-washing machine method

Soak-tank method

Spray-rinse method

Manual method

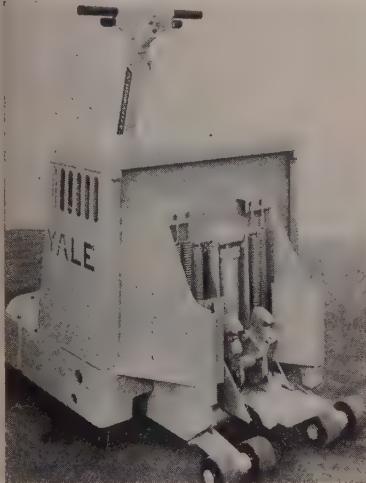
FREE For a copy of this 24-page booklet (Illustrated with photographs and diagrams), write Oakite Products, Inc., 34E Thames St., New York 6, N. Y.

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MADE IN U.S.A. • 100% GUARANTEED
MATERIALS • METHODS • SERVICE

Technical Service Representatives Located in
Principal Cities of United States and Canada

the Philadelphia Division, Yale & Towne Mfg. Co., 11000 Roosevelt Blvd., Philadelphia 15, Pa. In actual operation on a large trailer it is possible to engage the end of a caster-type trailer and make a right angle turn with the center of the turn being the fixed axle of the trailer. This gives the shortest steering radius possible with a given trailer.

In operation the Grip-Tow is driven to the end of the trailer and a push-button is pressed engaging a hook on



the tractor with the lower side of the trailer frame. The hook then pulls the trailer into intimate contact with the tractor. Next, a pair of secondary hooks reach out and grab the top part of the trailer from engaging tractor and trailer. Finally, the trailing wheels of the tractor lift off the floor so that the weight of the rear end of the tractor is supported on the trailer and both form an integral unit. This is all accomplished in a few seconds providing a powered trailer with high maneuverability.

Check No. 12 on Reply Card for more Details

Work Moves Quickly

A Transfer-matic to produce exhaust manifolds has been developed by Cross Co., Detroit 7, Mich. One operator is required to process 130 pieces per hour at 100 per cent efficiency. Operations include milling the joint face, the hot-spot pad and the tailpipe pad; drilling, reaming, chamfering and tapping all holes; and boring the tailpipe hole.

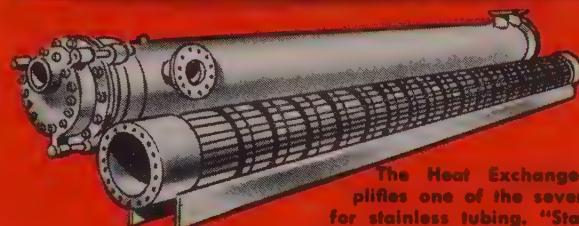
Machine is made up of ten stations including one for loading; four for milling; four for drilling, reaming and boring; and one for tapping. Pieces are carried on a palletized workholding fixture which securely hold the parts between stations and

Keep in Step with—

RIGID GOVERNMENT TUBING REQUIREMENTS



SPECIFY "Standard"
for Welded Stainless Steel Tubing



The Heat Exchanger exemplifies one of the severest uses for stainless tubing. "Standard's" stainless tubing meets this, as well as many other different requirements for strength, and heat and corrosion resistance.

Deal with the Specialist among Specialists

A tubing specialist, like other specialists, knows his trade best.

When you deal with "Standard" you deal with a tubing specialist who manufactures millions of feet of tubing every month from stainless and carbon steel—and for

25 years has been serving all types of industry for mechanical and pressure tubing applications.

If you need stainless tubing, be sure you specify "Standard". It pays to deal with the tubing specialist among specialists.

Stainless Tubing Size and Thickness

3/8" O.D. to 3" O.D.

.028 to .095 wall

Carbon Steel Tubing

1/2" O.D. to 5 1/2" O.D.

.028 to .260 wall

THE STANDARD TUBE CO.

Detroit 28,

Welded Tubing

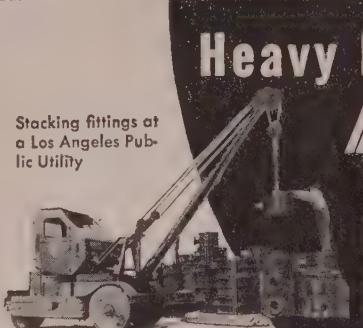
Michigan

Fabricated Parts

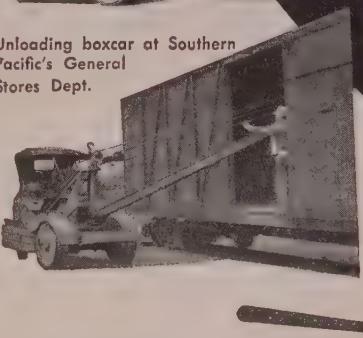
STANDARDIZE with STANDARD—It Pays



Stacking fittings at a Los Angeles Public Utility



Unloading boxcar at Southern Pacific's General Stores Dept.



Heavy Industries Use KRAINE KAIR SWING-BOOM MOBILE CRANE to Cut Costs by Handling Loads Easier, Faster, Safer

Gas or diesel, 12 to 37 ft. booms, or adjustable telescopic booms; solid or pneumatic rubber-tires. 1½, 2½, 5, and 10 ton cap. Buckets, magnets, all-weather or foldable tops, and other accessories available.

Handles tubes and heavy equipment at the Wilmington Refinery of the Union Oil Company



WRITE FOR BULLETIN NO. 79

SILENT HOIST & CRANE CO. 849 63rd ST., BROOKLYN 20, N.Y.

during all operations. Manifolds are clamped in the fixtures by means of a hydraulic power wrench. They are automatically returned from the last machining station to the loading station.

Check No. 13 on Reply Card for more Details

Accurate Measurements

Accurate measurements to a tolerance of 0.00002-inch are claimed for the Carson-Dice electronic micrometer made by the J. W. Dice Co., Englewood, N. J. An electronic circuit used in conjunction with an accurate micrometer head permits pressureless measurement and eliminates feel as a source of error. The electronic circuit is sufficiently sensitive to give



a positive on and off indication with only five millionths of an inch displacement at the contact. Several models are available with different work capacities for measurement on compressible or noncompressible materials either conducting or nonconducting in nature.

Micrometer can be used for measurement of machined parts, ball bearings, small assemblies and depths of counterbore. It can also be used to measure deflections in diaphragms, bimetal elements, spring bellows and similar applications.

Check No. 14 on Reply Card for more Details

Lightweight Welder

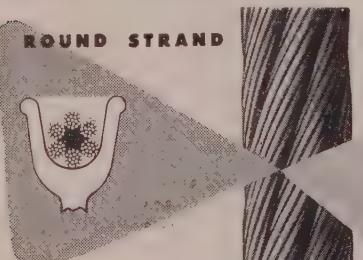
Precision Welder Mfg. Co., 660 W Grand Ave., Chicago, Ill., is adding a welder to its Shop-King line. Model 25A features six heat stages, has 20 to 100 amperes output, welds metals 24 gage to $\frac{1}{8}$ -inch thick, and handles rods $\frac{1}{16}$ to $\frac{1}{2}$ -inch. The unit is easy to move and is intended for light production, maintenance and repair welding.

Check No. 15 on Reply Card for more Details

Testing Amplifier

Sierra laboratory carrier amplifier available from Electronic Engineering Associates Ltd., 1070 Brittan Ave., San Carlos, Calif., is designed

ROUND STRAND



FLATTENED STRAND



SPECIFY STRONGER SAFER "HERCULES" FLATTENED STRAND

- 10% extra strength.
- Larger metallic area.
- Smooth wearing.
- Smooth running.
- Easier to rig.
- Extra safety
- Extra economy.

RED-STRAND
quality

'SPREADS THE LOAD FOUR WAYS

"Hercules" Flattened Strand design spreads wear over four wires—not just one. This compact outer surface greatly reduces wear in grooves... helps keep them smooth. Triangular cross-section of strands permits smaller core, larger contact area between strands, and greater resistance to crushing. "Hercules" Flattened Strand Wire Rope offers greater strength and economy.



LESCHEN
WIRE ROPE

Consult our Engineering Department for specific recommendations. A. LESCHEN & SONS ROPE CO., 5909 Kennerly Ave., St. Louis 12, Missouri. Distributors in all principal cities.

This MEEHANITE Ram Cylinder is...

"GUARANTEED AGAINST FAILURE"



Left—Ross & Company 20 Ton Hydraulic Press for Shop—Tool Room or Production Line

Right—The double acting Meehanite Ram Cylinder, honed to a mirror finish, is the heart of the hydraulic pump system.



Ross & Company, Chicago, Illinois, manufacturers of the 20-ton hydraulic press illustrated, fully guarantee their product "against failure due to workmanship or material for six months after date of sale." As an important component of this unit they specify only Meehanite cylinders which must be honed to a mirror finish. The versatility and accuracy of the action of the hydraulic pump is largely dependent upon the cylinder and its flawless, long wearing surface.

Only through rigid control of the metal structure can the needed engineering characteristics for a part of this type be obtained regularly and consistently. The Meehanite production processes provide these controls with the result that to designers, engineers and production executives throughout industry, Meehanite castings are synonymous with better properties, uniformity, dependability:—in a simple word QUALITY.

Write for our 25th Anniversary booklet "25 Years of Proof in Service."



MEEHANITE

NEW ROCHELLE, N. Y.

Take YOUR Casting Problem To A MEEHANITE FOUNDRY

Albion Foundry Co.	Albion, New York	Moorhead Foundry Co.	Moorhead, Minnesota
Atlas Foundry Co.	Baltimore, Maryland	Mountain States Foundry Co.	Mountain View, California
Atlanta Foundry Co.	Atlanta, Georgia	Montgomery Ward Foundry Co.	Montgomery, Alabama
Continental Gin Co.	Birmingham, Alabama	Montgomery Ward Foundry Co.	Montgomery, Alabama
Empire Pattern & Foundry Co.	Tulsa, Oklahoma	Montgomery Ward Foundry Co.	Montgomery, Alabama
Farrel-Birmingham Co., Inc.	Ansonia, Connecticut	Montgomery Ward Foundry Co.	Montgomery, Alabama
Florence Pipe Foundry & Machine Co.	Florence, Massachusetts	Montgomery Ward Foundry Co.	Montgomery, Alabama
Fulton Foundry & Machine Co.	Irvington, New Jersey	Montgomery Ward Foundry Co.	Montgomery, Alabama
General Foundry & Manufacturing Co.	Waukegan, Illinois	Montgomery Ward Foundry Co.	Montgomery, Alabama
Greenelee Foundry Co.	Greenelee, Connecticut	Montgomery Ward Foundry Co.	Montgomery, Alabama
The Hamilton Foundry & Mfg. Co.	Hamilton, Ohio	Montgomery Ward Foundry Co.	Montgomery, Alabama
Hardinge Company, Inc.	Hardinge Manufacturing Co.	Montgomery Ward Foundry Co.	Montgomery, Alabama
Johnstone Foundries, Inc.	Johnstone, Pennsylvania	Montgomery Ward Foundry Co.	Montgomery, Alabama
Kanawha Manufacturing Co.	Kanawha, West Virginia	Montgomery Ward Foundry Co.	Montgomery, Alabama
Lincoln Foundry Corp.	Lincoln, Massachusetts	Montgomery Ward Foundry Co.	Montgomery, Alabama
E. Lona Ltd.	London, Ontario, Canada	Montgomery Ward Foundry Co.	Montgomery, Alabama
Otis Elevator Co., Ltd.	London, Ontario, Canada	Montgomery Ward Foundry Co.	Montgomery, Alabama
The Henry Perkins Co.	London, Ontario, Canada	Montgomery Ward Foundry Co.	Montgomery, Alabama
Poholman Foundry Co.	London, Ontario, Canada	Montgomery Ward Foundry Co.	Montgomery, Alabama
Poseydale Foundry Co.	London, Ontario, Canada	Montgomery Ward Foundry Co.	Montgomery, Alabama
Ross-Meehan Foundries	London, Ontario, Canada	Montgomery Ward Foundry Co.	Montgomery, Alabama
Shenandoah-Penn Mfg. Co.	Shenandoah, Pennsylvania	Montgomery Ward Foundry Co.	Montgomery, Alabama
Standard Foundry Co.	Standard, Pennsylvania	Montgomery Ward Foundry Co.	Montgomery, Alabama
Warren Foundry & Pipe Corporation	Phillipsburg, New Jersey	Montgomery Ward Foundry Co.	Montgomery, Alabama

"This advertisement sponsored by foundries listed above."

for making low level measurements from transducers of stress, strain, displacement, pressure, temperature, velocity, acceleration, and other parameters. High gain characteristics are combined with low noise. Operating stability is achieved under adverse conditions of local electrical disturbances as well as temperature and humidity variations.

Equipment is housed in units which can be either mounted in standard 19-inch racks or bench-stacked. One power supply will energize one or two 2-channel bandpass amplifiers. To facilitate stress measurements, a special network provides readings from 120-ohm strain gages with calibration directly in terms of steel stress.

Check No. 16 on Reply Card for more Details

Toggle Clamp

Clamp No. 132-A, made by Wolverine Tool Co., Detroit 7, Mich., is a large push type toggle clamp for larger, heavier fixtures. It has a plunger 1 inch in diameter with a 2½-inch stroke; ultimate load is 10,000 pounds.

Check No. 17 on Reply Card for more Details

Prevents Dock Board Slippage

Magline Inc., Pinconning, Mich., offers a new drop lock for their line of dock board and ramp combinations. It is incorporated in the ramp section of the unit and automatically drops into place against the dock, securely holding the unit in position during loading operations.

Check No. 18 on Reply Card for more Details

Improved Precision Bed Turret

Improvements in the heavy duty Newton precision bed turret are announced by A. K. Tool Co., Los Angeles 39, Calif. Models are designed to fit 10 and 11-inch Logan lathes, 10-inch Powr-Kraft, 10-inch Atlas and 12-inch Craftsman lathes. All-steel turret head accommodates six tool positions and is self-indexing.

Check No. 19 on Reply Card for more Details

Safety Pliers

Designated as OG-1-DR3, the new safety pliers announced by Osborn Mfg. Co., Warsaw, Ind., feature round jaws to facilitate gripping parts at the side. It flattens instead of shatters the object caught in a closing die.

Check No. 20 on Reply Card for more Details

Pneumatic Control Instrument

An electronic potentiometer that has a 10 per cent proportional band, a 150 per cent proportional band and manual reset, or a 150 per cent pro-

portional band and automatic reset has been developed by Brown Instruments Division, Minneapolis-Honeywell Regulator Co., Philadelphia, Pa. It combines advantages of pneumatic control and a full 120-foot long, 11-inch calibrated width chart. Check No. 21 on Reply Card for more Details

Air Vibrator

Type AC (air cushioned), a new type noiseless air vibrator developed by Cleveland Vibrator Co., Cleveland, O., is suited for applications where air vibration is used at close proximity to employees and where noise is a major factor. Reciprocating action of a hard chrome-plated piston develops the vibrating action. This action is noiseless because the momentum set up by the piston is cushioned by a pocket of air at each end of the vibrator assembly.

Check No. 22 on Reply Card for more Details

Magnetic Starter

An in-between capacity size magnetic starter is introduced by Furnas Electric Co., Batavia, Ill. It is rated at 10 hp, 220-550 v, three phase, ac. It has renewable, rectangular type contacts of specially developed silver for maximum arc quenching properties and lowest contact resistance.

Check No. 23 on Reply Card for more Details

Paper Reproduces Blueprint

Kodagraph Repro-Negative paper, introduced by Eastman Kodak Co., Rochester 4, N. Y., is a new photographic reproduction paper that produces black-on-white photographic intermediates directly from blueprints and other negative originals without need for darkroom handling or special equipment.

Check No. 24 on Reply Card for more Details

Neox-Coated Rubber Gloves

A new type of rubber glove coated with Neox is offered by Hanson-Van Winkle-Munning Co., Matawan, N. J., for plating room use. The Neox coating is chemically welded to strong fabric. Seams are tight and safe against harmful fluids. Gloves are available in 14 and 18-inch elbow length gauntlet.

Check No. 25 on Reply Card for more Details

Automatic Ring Packing

Designated as Uneepac, a new automatic ring packing is announced by Johns-Manville, New York 16, N. Y. It is a molded packing and each ring is a complete, self-contained packing unit. It is designed for maximum sealing efficiency in minimum packing depth so stuffing box sizes can

be reduced. No follower or header rings are needed. The packing is offered in varied compositions to suit different services. It is furnished in sets of endless or split rings and is available for shafts ½-inch diameter and up.

Check No. 26 on Reply Card for more Details

Attenuator Switch

Shallcross Mfg. Co., Collingdale, Pa., offers a line of attenuator switches that includes 12 round, single-deck units in one and two-pole types with up to 60 contact positions and with rotations ranging from 144 to 360 degrees. Switches are obtainable with or without detent mechanism.

Check No. 27 on Reply Card for more Details

Power Attachment for Positioner

Newly designed power attachment for their balanced positioners are offered by Aronson Machine Co., Arcade, N. Y. Features of the unit are infinitely variable speeds from 0 to 6 rpm, quick engage and disengage of the power transmission for use of power rotation or manual rotation and positioning, worm and worm gear final drive adjustable to virtually eliminate backlash on the work table. Friction clutch coupling allows the operator to position workpiece on the rotational axis whether table is turning or not.

Check No. 28 on Reply Card for more Details

Air Grinder

A new air grinder, announced by Ingersoll-Rand Co., Phillipsburg, N. J., has an added safety device to prevent overspeed operation. It contains a motor governor to maintain correct wheel speed, plus a built-in unit called the overspeed safety coupling. In case motor overspeeds because of governor wear, abuse, maladjustment or dirty air, this safety coupling automatically uncouples the arbor and grinding wheel from the motor. Grinder is available for 8, 6 or 5-inch wheels running at respective motor speeds of 3100, 4100 and 4500 rpm.

Check No. 29 on Reply Card for more Details

FOR MORE INFORMATION

on the new products and equipment in this section, fill in a card. It will receive prompt attention.

The Metal Market

Allocations of copper to foundries to start Oct. 1 as shortage is aggravated by strike of miners and mill workers. Shrinkage of red metal scrap also cuts copper supply

BEGINNING Oct. 1, allocations of copper raw materials to individual brass and bronze foundries will be based on historical patterns of consumption during 1950.

Foundries using less than 10,000 pounds of copper materials a month will apply for metal on form NPAF-83 for a six month period, Oct. 1, 1951, through March, 1952. They will be permitted to place monthly orders for one-sixth of the total quantity of material allotted over the six-month period.

Foundries using from 10,000 to 100,000 pounds will be allocated copper materials on a three-month basis. Authority will be granted to them to purchase one-third of their total allotments during each month of the three-month period.

Allocations will be made on a monthly basis to foundries using 100,000 to 2 million pounds of copper raw material a month (large minor foundries) and to foundries using 2 million pounds or more a month (large major foundries). About 80 per cent of the industry's total output is produced by these last two classes of foundries.

Supplies Cut—Work stoppages in the copper mining industry, as well as a shrinkage of supplies of copper and copper-base alloy scrap, have reduced drastically the supply of domestic copper. Although copper imports are still being received, a large percentage of these materials is in the form of ores, concentrates or blisters, the processing of which has been hampered recently by plant shutdowns. Under normal conditions, the mine-to-market cycle consumes 90 to 120 days. Consumers will feel effects of the strike throughout the remainder of this year and can not expect full relief much before January, 1952.

Get ACM Order for Copper

Producers of copper controlled materials are prohibited from filling any orders after Oct. 1 other than authorized controlled material (ACM) orders. This restriction provides the final step in transition to a 100 per cent CMP operation in the fourth quarter, so far as copper is concerned. This action does not cancel the reservation of production to fill unrated orders which may be converted up to and including Sept. 10 by consumers who have received authorized CMP allotments. Conversion of an unrated order into an ACM order is permitted.

Producers having copper controlled material in actual process of production to fill orders other than ACM orders, which can not be shipped prior to Oct. 1, must divert that production to fill ACM orders wherever possible. Where diversion is not possible, the producer is directed to submit im-

mediately to NPA a list of orders in that category, giving the names of purchasers affected, description of material orders, DO rating (if any) and probable shipping dates. Although shipment may not be made prior to Oct. 1, production on such orders should not be stopped except when specifically directed by NPA.

Brass Ingot Prices Decline

Prices declined 1.25 cents to 3.75 cents a pound, effective Sept. 4, on all brass and bronze ingots except alloys 193 to 242 in the 88-10-2 group. This action was taken to realign ingot prices with ceiling prices established on scrap materials. A large producer cut prices of all alloys in the 85-5-5 group 1.75 cents a pound. Ingots in the 88-10-2 group, with the exceptions noted above, were cut 1.25 cents to 3.50 cents. Alloys in the 80-10-10 group were cut 1.75 cents. Price reductions in the No. 1 yellow ingot group and in the nickel alloy group were cut 2 cents to 2.50 cents. Price for aluminum bronze alloy No. 415 dropped 3.75 cents, while prices of all manganese bronze ingots were cut 2.75 cents to 3.25 cents a pound. The price for silicon bronze ingot No. 500 was cut 3.75 cents. Producers anticipate an early improvement in the availability of scrap required in their operations.

Warehouses Get Relief

Distribution of brass mill products from warehouses will be improved. National Production authority issued order M-82 to assist distributors in maintaining inventories at workable levels.

A distributor of brass mill products may replace his inventory by using the allotment symbol "X6" to replace products by weight which were delivered in the preceding month to fill DO and authorized controlled material orders. If his inventory at the monthend is less than his average monthly inventory during the period Jan. 1, 1947, to June 30, 1950, the distributor may place an X6 order on a brass mill for 5 per cent of the difference. The total weight of all orders designated X6 placed in any one month can not, however, exceed 150 per cent of the average monthly weight of his base period deliveries.

A brass mill is not required to accept an X6 order from any distributor who was not a purchaser from the mill during the base period, or an X6 order for any item of brass mill products not purchased by him from the mill during the base period.

A distributor is not required to accept rated orders for any item in excess of 500 pounds or one-half of his inventory of that item, whichever is less, unless otherwise directed by

NPA. He may not accept orders for more than 2000 pounds of any item.

Delivery of brass mill products by domestic brass mills may not be accepted by a distributor if his inventory would become larger than his average monthly base period inventory, or larger than a minimum practicable working inventory.

Operates Zirconium Plant

United States Bureau of Mines' northwest electro development laboratory in Albany, Oreg., has been converted into the world's largest producer of zirconium. Requirements of the Atomic Energy Commission and other demands for this metal are being met by an expansion program, involving buildings and facilities, at the pilot plant in that city. Two structures, one to house a purification plant and the other consisting of an addition to the main plant, are nearing completion.

Canadian Aluminum Project

Aluminum Co. of Canada's new aluminum project at Kitimat, B. C., will have an initial production of 80,000 tons a year. McNeely Dubose, vice president, sets mid-1954 as the probable date for start of production.

Metals Firm Moves Plant

K. Hettleman & Sons Inc., Baltimore, dealer in scrap metals and manufacturer of brass and bronze ingots, acquired the former plant of Brooklyn Chemical Works Inc., Brooklyn, Md. Hettleman plans to transfer to these new quarters, containing about 150,000 square feet of floor space, around the first of next year. The company will utilize 60,000 square feet of space, holding the remainder for sale or lease. A considerable amount of new equipment is to be installed. The company's present plant, containing 40,000 square feet of floor space, will be either sold or leased.

Federated Builds in South

Federated Metals Division, American Smelting & Refining Co., New York, will start construction of a plant in Birmingham as soon as engineering details are completed. Products to be made in the new plant are brass and bronze ingots, aluminum and magnesium alloys, babbitt metals, solders, type metals, copper, zinc and lead anodes, zinc dust, magnesium anodes, die-casting metals, and lead products.

E. L. Newhouse Jr., vice president of Federated, expects the Birmingham plant will become an important link in the division's chain of nonferrous metal producing facilities.

American Smelting plans to construct an addition to its Corpus Christi, Tex., plant. This will result in added capacity of 2000 tons per month for production of special high grade zinc.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c. Conn. Valley; Lake 24.62 1/4c, delivered.

Brass Ingots: 85-5-5 (No. 115) 27.25c; 88-10-2 (No. 215) 38.50c; 80-10-10 (No. 305) 32.25c; No. 1 yellow (No. 405) 23.25c.

Zinc: Prime western 17.50c; brass special 17.75c; intermediate 18.00c, East St. Louis; high grade 18.85c, delivered.

Lead: Common 16.80c; chemical 16.90c; cor-rod 16.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 19.00c, pigs 18.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb. c.l. orders.

Secondary Aluminum: Piston alloys 20.50c; No. 12 foundry alloy (No. 2 grade) 19.50c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 18.00c; grade 2, 17.75c; grade 3, 17.25c; grade 4, 16.50c.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 103.00.

Antimony: American 99-99.8% and over but not meeting specifications below 42.00c; 99.8% and over (arsenic 0.05% max.; other impurities 0.1% max.) 42.50c; f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 56.50c; 25-lb pigs, 59.15c; "XX", nickel shot, 60.15c; "F" nickel shot or ingots, for addition to cast iron, 56.50c. Prices include import duty.

Mercury: Open market, spot, New York, \$195-\$200 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, \$1.56 per lb of alloy, f.o.b. Reading, Pa.

Cadmium: "Regular" straight or flat forms, \$2.55 del.; special or patented shapes \$2.80.

Cobalt: 97.99%, \$2.10 per lb for 500 lb (kegs); \$2.12 per lb for 100 lb (case); \$2.17 per lb under 100 lb.

Gold: U. S. Treasury, \$35 per ounce.

Silver: Open market, New York 90.16c per oz.

Platinum: \$90-\$93 per ounce from refineries.

Palladium: \$24 per troy ounce.

Iridium: \$200 per troy ounce.

Titanium (sponge form): \$5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Ceiling prices, cents per pound, f.o.b. mill; effective Aug. 23, 1951)

Sheet: Copper 41.68; yellow brass 38.28; commercial bronze, 95% 41.61; 90% 41.18; red brass, 85% 40.14; 80% 39.67; best quality, 39.15; nickel silver, 18%, 53.14; phosphor-bronze grade A, 5%, 61.07.

Rod: Copper, hot-rolled 37.53; cold-drawn 38.78; yellow brass free cutting, 32.63; commercial bronze, 95% 41.30; 90% 40.82; red brass 85% 39.83; 80% 39.36.

Seamless Tubing: Copper 41.72; yellow brass 41.29; commercial bronze, 90% 43.79; red brass, 85% 43.05.

Wire: Yellow brass 38.57; commercial bronze, 95% 41.90; 90% 41.42; red brass, 85% 40.43; 80% 39.96; best quality brass, 39.44.

(Base prices, effective Nov. 6, 1950)

Copper Wire: Bare, soft, f.o.b. eastern mills, c.l. 28.67-30.295; i.c.l. 29.17-30.92; 100,000 lb lots 28.545-30.295; weatherproof, f.o.b. eastern mills, c.l. 30.10, i.c.l. 30.18, 100,000 lb lots 29.35; magnet, del., 15,000 lb or more 34.50, i.c.l. 35.25.

Copper Wire: Bare, soft, f.o.b. eastern mills, c.l. 28.67-30.295; i.c.l. 29.17-30.92; 100,000 lb lots 28.545-30.295; weatherproof, f.o.b. eastern mills, c.l. 30.10, i.c.l. 30.18, 100,000 lb lots 29.35; magnet, del., 15,000 lb or more 34.50, i.c.l. 35.25.

DAILY PRICE RECORD

1951	Copper	Lead	Zinc	Tin	Aluminum	An-	timony	Nickel	Silver
Sept. 1-6	24.50	16.80	17.50	103.00	19.00	42.00	56.50	90.16	
Aug. 1-31	24.50	16.80	17.50	103.00	19.00	42.00	56.50	90.16	
Aug. Avg.	24.50	16.80	17.50	103.00	19.00	42.00	56.50	90.16	
July Avg.	24.50	16.80	17.50	106.00	19.00	42.00	56.50	90.16	
June Avg.	24.50	16.80	17.50	117.962	19.00	42.00	56.50	88.492	
May Avg.	24.50	16.80	17.50	139.923	19.00	42.00	50.50	90.16	
Apr. Avg.	24.50	16.80	17.50	145.735	19.00	42.00	50.50	90.16	
Mar. Avg.	24.50	16.80	17.50	145.730	19.00	42.00	50.50	90.16	
Feb. Avg.	24.50	16.80	17.50	182.716	19.00	42.00	50.50	90.16	
Jan. Avg.	24.50	16.80	17.50	171.798	19.00	35.462	50.50	88.890	

NOTE: Copper: Electrolytic, del., Conn. Valley; Lead, common grade, del., St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del., New York; Aluminum primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders)

Sheets and Circles: 28 and 3S mill finish c.l.

Thickness	Widths or Diameters	Flat	Coiled	Sheet
Inches	In., Inc.	Sheet	Sheet	Circle†
0.249-0.136	12-48	30.1	...	...
0.135-0.096	12-48	30.6	...	...
0.095-0.077	12-48	31.2	29.1	33.2
0.076-0.061	12-48	31.8	29.3	33.4
0.060-0.048	12-48	32.1	29.5	33.7
0.047-0.038	12-48	32.5	29.8	34.0
0.037-0.030	12-48	32.9	30.2	34.6
0.029-0.024	12-48	33.4	30.5	35.0
0.023-0.019	12-36	34.0	31.1	35.7
0.018-0.017	12-36	34.7	31.7	36.6
0.016-0.015	12-36	35.5	32.4	37.6
0.014	12-24	36.5	33.3	38.9
0.013-0.012	12-24	37.4	34.0	39.7
0.011	12-24	38.4	35.0	41.2
0.010-0.0095	12-24	39.4	36.1	42.7
0.009-0.0085	12-24	40.6	37.2	44.4
0.008-0.0075	12-24	41.9	38.4	46.1
0.007	12-18	43.3	39.7	48.2
0.006	12-18	44.8	41.0	52.8

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.)	Round		Hexagonal	
	R317-T4, across flats	17S-T4	R317-T4	17S-T4
0.125	52.0	...	...	...
0.156-0.188	44.0	...	...	...
0.219-0.313	41.5	...	...	...
0.375	40.0	46.0	48.0	...
0.406	40.0	...	...	...
0.438	40.0	46.0	48.0	...
0.469	40.0	...	...	...
0.500	40.0	46.0	48.0	...
0.531	40.0	...	...	...
0.563	40.0	...	45.0	...
0.594	40.0	...	...	...
0.625	40.0	43.5	45.0	...
0.688	40.0	...	45.0	...
0.750-1.000	39.0	41.0	42.5	...
1.063	39.0	...	41.0	...
1.125-1.500	37.5	39.5	41.0	...
1.563	37.0	...	...	...
1.625	36.5	...	39.5	...
1.688-2.000	36.5	...	...	...

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more \$22.00 per cwt; add 50c cwt 10 sq ft to 140 sq ft. Pipe: Full coils \$22.00 per cwt. Traps and bends: List prices plus 60%.

ZINC

Sheets, 24.50c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 23.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 23.50-24.50c; over 12-in., 23.50-25.40c.

"A" NICKEL

(Base prices f.o.b. mill) Sheets, cold-rolled, 77.00c. Strip, cold-rolled, 63.00c. Rods and shapes, 55.50c. Plates, 55.50c. Seamless tubes, 106.00c.

MONEL

(Base prices, f.o.b. mill) Sheets, cold-rolled 60.50c. Strip, cold-rolled, 63.50c. Rods and shapes, 55.50c. Plates, 55.50c. Seamless tubes, 93.50c. Shot and blocks, 53.50c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, \$15; sheared mill plate, \$12; strip, \$15; wire, \$10; forgings, \$6; hot-rolled and forged bars, \$6.

Plating Materials

Chrome Acid: 99.9% flakes, f.o.b. Philadelphia, carloads, 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat, rolls 38.34c; oval 37.84c.

Nickel Anodes: Rolled oval, carbonized, carloads, 74.50c; 10,000 to 30,000 lb, 75.50c; 30,000 to 100,000 lb, 76.50c; 500 to 3000 lb, 77.50c; 100 to 500 lb, 78.50c; under 100 lb, 82.50c, f.o.b. Cleveland.

Nickel Chloride: 36.50c in 100 lb bags; 34.50c in lots of 400 lb through 10,000 lb; 34.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on 400 lb or more.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 77.7c; 100 or 350 drums only, 100 to 600 lb, 63.1c; 700 to 1900 lb, 60.6c; 2000 to 9900 lb, 58.9c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Tin Anodes: Bar, 1000 lb and over, \$1.19; 500 lb, 99.9 lb, \$1.195; 200 to 499 lb, \$1.20; less than 200 lb, \$1.215. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Zinc Cyanide: 100 lb drums, less than 1000 lb, 47.7c, 10 or more drums, 45.7c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bags, less than 2000 lb \$1.0000; more than 2000 lb, 98.09c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Chloride (Anhydrous): In 400 lb bags, 87.23c; 100 lb kegs 88.23c. Freight allowed.

Scrap Metals

Brass Mill Allowances

Ceiling prices in cents per pound for less than 20,000 lb, f.o.b. shipping point, effective July 26, 1951.

Clean **Heavy** **Ends** **Turnings**
Copper 21.50 21.50 20.75

Yellow Brass 19.125 18.875 17.875

Commercial Bronze 95% 20.50 20.25 19.75
90% 20.50 20.25 19.75

Red Brass 85% 20.25 20.00 19.625
80% 20.125 19.375 19.375

Muntz metal 18.125 17.875 17.875

Nickel silver, 10% 21.50 21.25 10.75
Phos. bronze, 5% 25.25 25.00 24.00

Copper Scrap Ceiling Prices

(Base prices, cents per pound, less than 40,000 lb f.o.b. point of shipment)

Group I: No. 1 copper 19.25; No. 2 copper wire and mixed heavy 17.75; light copper 16.50; No. 1 borings 19.25; No. 2 borings 17.75; refinery brass, 17.00 per lb of dry C content for 50 to 60 per cent material, 17.25 per lb for over 60 per cent material.

Group II: No. 1 soft red brass solids 19.50c. No. 1 composition borings 19.25 per lb of C content plus 83 cents per lb of tin content.

Mixed brass borings 19.25 per pound of C content plus 78 cents per lb of tin content.

Unlined red car boxes 19.25; lined red car boxes 18.25; cocks and faucets 16.75; mixed brass screens 16.00; zincy bronze solids 16.25; zincy bronze borings 16.00; zincy bronze scrap 9.50c.

Zinc Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment)

Battery lead plates, 17.00c per lb of lead and antimony content, less smelting charge of 1 cent per lb of material in lots 15,000 lb or more; less 2.25c in lots less than 15,000 lb.

Used storage batteries (in boxes) drained oil, 6.40c for 15,000 lb or more; 6.40c for less than 15,000 lb. Soft lead scrap, hard lead scrap, battery slugs, cable lead scrap or lead content of lead-covered cable scrap, 15.25c per lb. In addition, brokerage commission are permitted.

Aluminum Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment, less than 5000 lb)

Segregated plant scrap: 2s solids, copper free 10.50, high grade borings and turnings, 8.50c.

No. 12 piston borings and turnings, 7.50c.

Mixed plant scrap: Copper-free solids, 10.00c; dural type, 9.00c; Oboeata scrap: Pure oil, 10.00c; sheet and sheet utensils, 7.25c; oil castings and forgings, 7.75c; clean pistons, free of struts, 7.75c; pistons with struts, 5.75c.

AVAILABLE FOR QUICK DELIVERY

Approximately 175 TONS SURPLUS STOCK

B&W STAINLESS STEEL TUBING SEAMLESS AND WELDED

Following grades and size ranges included in this lot. (All this material is subject to prior sale.)

B&W GRADE	AISI GRADE	TYPE*	O.D. RANGE	WALL RANGE
Croloy 18-8	302	S	2.467	3.156
		W	1.000	2.000
Croloy 18-8 Si	302B (Mod)	S	2.375	3.250
Croloy 18-8 FM	303 (Mod)	S	1.125	2.625
Croloy 18-8 S	304	S	.625	5.563
		W	1.000	4.500
Croloy 25-12	309 S	W	1.050	4.000
Croloy 25-12 Cb	309 Cb	S	1.315	1.500
		W	1.050	1.315
Croloy 25-12 CbTa	309 CbTa	W	1.000	3.500
Croloy 25-20	310	S	1.000	3.125
		W	1.313	2.750
Croloy 16-13-3	316	S	.750	5.000
		W	1.000	4.500
Croloy 16-13-3 Cb	316 Cb	S	1.050	3.000
Croloy 18-13-3	317	S	.625	2.625
		W	1.000	4.000
Croloy 18-8 Ti	321	S	1.000	5.118
		W	1.250	2.875
Croloy 18-8 Cb	347	S	.688	6.625
		W	1.000	4.500
Croloy 18-8 CbTa	347 Ta	S	1.050	3.375
Croloy 12 A1	405	S	1.000	6.500
Croloy 12	410	S	1.000	3.250
		W	3.000	4.166
Croloy 12-1/2 Mo.	410 (Mod)	S	1.050	2.875
Croloy 12-2	414	S	1.770	4.000
Croloy 18	430	S	1.000	5.000
		W	1.125	2.250
Croloy 22	443	S	2.375	3.250
Croloy 27	446	S	.813	6.625
19-9 D L		W	2.250	2.500
				.050
				.065

* S—Seamless W—Welded

A list of actual material included in this lot is available on request.†

This stock is surplus material and covers overages, short lengths, etc. produced against orders for mechanical and pressure tubing involving a number of different specifications and grades. Because of the number of specifications and grades involved, the dimensional tolerances, surface finish and mechanical properties vary. It is highly desirable to incorporate in your inquiry or order the details of standards and chemistries which will be acceptable to you. If this is done, it will enable B&W to do a better job of handling your requirements.

†Please address orders or inquiries for any of this material to the nearest B&W Tube Company District Sales Office.

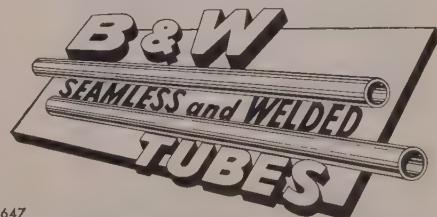
Beaver Falls, Pa.	712 Eleventh Street
Boston 16, Mass.	250 Boylston Street
Chicago 3, Ill.	105 South LaSalle Street
Cleveland 14, Ohio	629 Euclid Avenue
Denver 1, Colo.	P. O. Box 1108
Detroit 26, Mich.	1717 Ford Building
Houston 2, Texas	Bankers Mortgage Building
Los Angeles 17, Calif.	1111 Wilshire Blvd.
New York 16, N. Y.	22 East 40th Street
Philadelphia 2, Pa.	Packard Building
San Francisco 3, Calif.	Humboldt Bank Bldg.
St. Louis 1, Mo.	Paul Brown Building
Syracuse 2, N. Y.	109 S. Warren Street
Tulsa 3, Okla.	Philtower Building
Toronto, Ontario, Canada	159 Bay Street

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INQUIRIES PROMPTLY ANSWERED

Sheets, Strip . . .

Sheet and Strip Prices, Page 157 & 158

Chicago—Demand for light flat-rolled products exceeds supply but inquiries have lessened. Easing in pressure for carbon sheets has pushed down the price for gray market material. Where sheets were commanding 22 to 24 cents a pound not so long ago in the gray market they now are reported available at 12 cents, and in some instances as low as 8 cents. Also indicative of the slightly easier demand for sheet and strip is a report that consumers who can't find a place to "cash" their CMP tickets for fourth quarter are not complaining about the delay they're encountering but are exhibiting only an irritation over CMP. Absence of complaints over delays suggests inventories of sheet and strip are good. Tightest of all light flat-rolled products is galvanized sheets, producers not only being crimped by government restrictions on zinc consumption but being unable to get deliveries of as much zinc as government regulations allow. Silicon sheet and strip for fractional horsepower motors is in lighter demand but for heavy motors it continues strong. One steel producer will open books in the next two or three weeks for selective acceptance of orders for first-quarter delivery of light flat-rolled products.

New York—Sheet sellers are in receipt of a heavy volume of orders for shipment after turn of the year. Some of these orders are for shipment as late as third quarter. However, except for certain military requirements most sellers are rejecting orders for beyond first quarter and very few for even that period. Meanwhile orders are still coming through for fourth quarter of this year but as all mills are booked up solidly on all major items little is being accepted. Certain producers can enter a little business in straight chrome grades but that is all. However, it appears allotments to a number of federal agencies will be well below stated requirements and where these allotments run less than orders already entered on mill books, some cancellations for fourth quarter may yet develop.

Boston—By December, possibly before with some cold-rolled strip producers, more normal customer relationships will be established by the mills. Most converters will lead integrated mills in this respect. Pressure for carbon flat-rolled is easing. Some old unrated delinquent orders have been dropped. Direct armament buying is heavier. Springfield armory has quotations on 2840 tons of steel cartridge clips and placed 233 tons of special strip with Wallingford Steel Co. and 135 tons with Firth Sterling Steel & Carbide Corp., McKeesport, Pa.

Philadelphia—Demand for coated sheets and hot-rolled carbon sheets is outstanding. Producers have nothing left for this quarter, unless cancellations should later develop, and are booking little for shipment beyond.

Pittsburgh—NPA revision of basic steel order M-1 allowing producers to accept orders from regular customers after military needs are assured has resulted in some limited rearrangement of fourth quarter sched-



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ules in an attempt to aid established customers as soon as possible. Most customers will not realize the benefit of the NPA ruling until first quarter 1952, however. Carryovers will be a serious problem into 1952.

Cleveland—Sheetmakers are under pressure from consumers for shipments but the supply stringency in the flat-rolled products appears less acute than in shapes, plates and bars. The reason for this is that consumer durable goods manufacturers have been forced to cut their production schedules and consequently are not pressing for tonnage like they were a few months back. Still, output of the mills continues to fall short of demands.

Steel Bars . . .

Bar Prices, Page 157

Cleveland—Tight bar supply will be encountered through fourth quarter. Substantial monthly carryover is expected by the mills all through the period. This will necessitate monthly adjustments in rolling schedules with attendant delays in shipments. Extent to which uncovered CMP tonnage for fourth quarter will be taken up by the mills depends on the volume of cancellations that are received.

Chicago—Hot-rolled carbon bars continue in extremely strong demand. Contributing to this demand are requirements of cold finishers, who are trying to fill astronomical-size orders for cold-finished bars for projectile shells and fuses and other defense items. Even though NPA regulations provide cold finishers a monthly supply of hot-rolled stock equal to at least 110 per cent of their base period monthly average usage, they find this is not enough. One mill doing conversion work still can take bookings for hot-rolled bars, provided billets are supplied.

Boston—While bar mills are booked through fourth quarter on most carbon grades, some volume in stainless for December is open, although this tonnage is being taken up rapidly. Deferments and cancellations are appearing from anti-friction bearing shops. Screw machine and forging shops are taking full allocations. Watertown arsenal is inquiring for substantial quantities of forgings.

Philadelphia—Due in part to heavy arrearages, some leading bar sellers have not as yet been able to set up fourth quarter schedules with any assurances they will stick.

Pittsburgh—Bars, all types, will be in short supply into next year. Convertors of hot bars to cold-finished are in much better position due to the NPA guarantee of 110 per cent base period receipts for first and second quarters 1952. This ruling does not solve their immediate supply problem and the convertors will have difficulty throughout fourth quarter.

Seattle—Bar mills hold substantial order backlog and they are turning away considerable prompt shipment business. However, some capacity is open for quick shipment tonnage on national emergency account. Northwest Steel Rolling Mills is operating two shifts, five days weekly. About 2000 tons of reinforcing bars for public works projects are pending.

Plates . . .

Plate Prices, Page 157

New York—Plate sellers generally are restricting new bookings for next year largely to the first quarter and even then principally to military directives. Some cancellations on tonnage scheduled before end of this year may develop, however, thus providing for the insertion of some new tonnage. But, in any event, cancellations should not have much effect before late in fourth quarter. Of particular interest to plate makers is word from Washington that the Defense Transport Administration will receive allotment for fourth quarter for only 30,000 tons as against stated requirements of 104,553 tons and that the Petroleum Administration for Defense will receive an allotment of 60,000 tons against 102,123 tons.

Philadelphia—Central Iron & Steel Co., Harrisburg, Pa., has advanced its price on carbon plates from 4.95c to 6.75c Harrisburg, effective Sept. 1. This is an increase of \$36 a ton.

Boston—Plate fabricating shops with few exceptions consider fourth quarter allotments too low to meet requirements, most in some way connected with defense. Some consumers, including weldment fabricators, are seeking restoration of tonnage more in line with pre-CMP pattern. Business with small tank builders is holding well while shipyard backlog is growing.

Pittsburgh—On the basis of present fourth quarter commitments plate producers will have carryovers beyond Jan. 1. Pressure will increase in fourth quarter from carryover from third quarter. Required minimum bookings by producers were figured on the basis of a fully productive month with no percentage allowance made for carryover, mill delay or strikes.

Fabricators report relatively good deliveries but building inquiries are increasing and backlog of construction is heavy. Inquiries are usually in step with defense plant expansion. Builders of inland waterway barges requested larger allocations of plates for first quarter 1952. They are allotted 80,000 tons for fourth quarter and seek an additional 33,000 tons.

Seattle—Fuel storage at McChord air field and a tank farm for Monsanto Chemical Co. here involve unstated tonnages of plates. Inadequate supply of steel is handicapping fabricators. Some fourth quarter allotments have been received. American Pipe & Construction Co. is fabricating 568 steel pots, heavy plate 20x9x3 ft each, for Alcoa's new plant near Wenatchee, Wash.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 157

Boston—Orders placed for 6000 tons reduces unplaced concrete reinforcing bar volume, but substantial tonnages still pend for housing and bridges. Contracts include 3200 tons, Providence, R. I., housing. Starting Oct. 1 fabricated reinforcing bars will be classified as CMP class "A" products with code number 34415. Fabricators must obtain allotments from the customer if scheduled for delivery after Sept. 30.

Los Angeles—Drastic increases in federal building bans coupled with heavier military and naval construction spurred valuation of construction in southern California in July to \$154,322,806, 23 per cent higher than in June, and second highest level in the district's history.

Wire . . .

Wire Prices, Page 159

Boston—Volume of wire orders is more uneven as to products. While some equipment is overloaded, other departments could handle more tonnage. There are openings for fourth quarter, even October, on some carbon products and alloy bookings are spotty. At least eight mills, one in New England, are increasing capacity for .015 diameter stainless wire under government contract.

Structural Shapes . . .

Structural Shape Prices, Page 157

Chicago—Demand for structural shapes far outstrips supply. All sizes and shapes are booked up through rest of the year and there is considerable inquiry for next year. However, one mill still can take bookings for rolling small structural from billets. Complaint over the insufficiency of structural and other steel used for bridges and highways is voiced by Frank N. Barker, chief state highway engineer of Illinois. He says initial allotment of steel for Illinois for the first quarter of 1952 is 40 per cent of that for fourth quarter 1951. This would be 4597 tons, 2149 of which may be used for bridges.

Boston—Fabricating shops with orders for defense plant expansion are likely to get most plain material needed for fourth quarter, but status of many other projects, including bridges is in doubt. Cutbacks are aimed to ease the overload on structural mills and result in some schedule revisions by fabricating shops. Latter are pacing operations to availability of plain material and could turn out more tonnage if steel could be obtained.

New York—Sharp curtailment of steel for construction not tied in directly with military production in fourth quarter is expected to result in revisions of schedules at fabricating shops. Tonnage available for the steel expansion program in the period is to be sliced by almost half, according to word from Washington. The aluminum expansion program appears to be the only exception in the general cutback.

Philadelphia—Structural activity is confined principally to bridge work, with awards relatively light in the aggregate. Restriction in the amount of steel available in fourth quarter for various industrial expansion programs is expected to result in readjustments in fabricating shop schedules. Some shops may be forced to curtail sharply after end of October.

Pittsburgh—Demand pressure is expected to mount throughout fourth quarter. Over-validation will account for increasing carryovers each remaining month this year. Proper governmental handling can reduce confusion created by this carryover condition but no matter what action is

taken its effect won't be felt until first quarter 1952. Producers here are booked to capacity.

Cleveland—Extent to which industrial construction in this area will be cut back as result of reduction in allocations of structural steel because of the acute shortage is uncertain. Even jobs that are pretty well along are expected to be delayed. This includes much steel plant expansion in the immediate Cleveland district, which, it is understood, is well advanced.

There is little prospect that supply conditions in structural steel will materially improve for months to come. At the current rate of shape production, 400,000 to 425,000 tons monthly, there just isn't enough to meet all demands.

Seattle—Fabricators, holding heavy order backlog, are not interested in immediate future shipment business. However, they are receptive with respect to 1952 orders. Meanwhile, industrial expansion is absorbing a large tonnage of available steel.

Tubular Goods . . .

Tubular Goods Prices, Page 161

Boston—Indications are merchant steel pipe distributors will continue to take full allotments for November. Several utilities are having trouble getting requirements for gas line extensions. Seamless and tubing specialties are sold far in advance. Union Hardware Co., Torrington, Conn., booked 367,000 feet of steel tubing for Springfield armory.

Pig Iron . . .

Pig Iron Prices, Page 156

Cleveland—Merchant pig iron sellers anticipate gradual increase in consumer pressure for tonnage as the fall advances. Steady increase in defense castings requirements is expected from here on to offset slackening attending curtailment in consumer durable goods. At the same time, resumption of foundry schedules following vacation shutdowns is expected to bring out renewed demands from melters that have been more or less quiescent in recent weeks. However, the foundries can look for little additional iron with output of the furnaces fully committed. In fact, closing down of one merchant stack in this immediate district will contribute to the stringency since customers of this furnace have been unable to build inventories to tide them over the period of shutdown.

Boston—Pressure for pig iron is easing and the melt has not recovered from earlier slackening. Volume is down with more jobbing foundries, textile equipment builders and a few others. Consumption of malleable is heavier than for foundry grade. Most customers of Mystic Furnace, nearly 100 per cent, indicate they will renew contractual agreements with that furnace. Some consumers not operating under the plan currently have expressed a desire to join when the matter comes up in midyear 1952.

New York—While some gray iron foundries' business is spotty momentarily, they are interested in all the

pig iron they can get—at least short of paying premium prices for foreign iron. They anticipate better demand for castings as the fall gets underway.

Buffalo—The acute supply situation in merchant pig iron became more serious when a leading producer here was forced to shut down its largest furnace for relining and general rehabilitation. The furnace, a 70-ton producer, has been in action for more than six years. High grade Swedish ore is again moving into the area via the St. Lawrence river from Canada.

Philadelphia—While basic consumers are pressing hard for tonnage, pig iron sellers say demand for foundry grades is less pressing. However, this situation is believed temporary.

Pittsburgh—Demand pressure for pig iron is increasing. Foundry and steel plant operations are up slightly with vacations ended. At present 5 of 54 district blast furnaces are operating. One stack at National Tube Co.'s McKeesport Works underwent minor repairs last week and was quickly returned to full operation.

Chicago—Demand for merchant pig iron has eased but it still exceeds supply. Easing stems from production cutbacks by some foundries, largely captive ones, working on orders for the automobile and farm implement industries.

Ferroalloys . . .

Ferroalloy Prices, Page 163

Washington—Domestic production of silicon and all grades of silicon alloys, totaled 219,724 net tons in second quarter 1951, decline of 9 per cent from first quarter. Of the total blast furnace output of silvery pig iron was 45,598 tons, 21 per cent of total production; electric furnace production increased to 149,944 tons or 68 per cent of the total; the remaining 24,182 tons, or 11 per cent, consisted of silicon metal, silicon briquettes, and miscellaneous silicon alloys.

Shipments amounted to 233,65 tons in second quarter compared with 224,945 tons in first quarter. Apparent consumption of silicon alloys increased to 239,750 tons in second quarter against 234,465 tons in the first three months this year, gain 2 per cent.

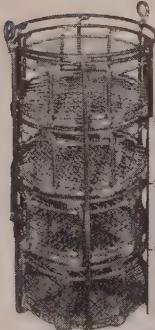
Tin Plate . . .

Tin Plate Prices, Page 158

Washington—Task group will be appointed by the National Production Authority to develop industry-wide classifications of secondary tin mill products. The industry committee has asked that unmended mended tin and terne waste-waste, and blast plate rejects, be considered controllable materials, and that tin plate strip, lithographed misprints, black plate wasters, cobbles, resorted tin and terne waste-waste be decontrolled.

Requests also were made to increase the 12,500 tons of tin in secondaries reserved for export during fourth quarter. It also was recommended by the committee that study be undertaken to determine the extent of jobbers' inventories in secondaries. These are reported large

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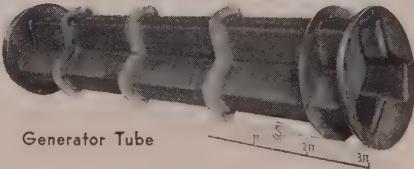


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Iron Ore . . .

Iron Ore Prices, Page 163

Cleveland—Shipments of Lake Superior iron ore declined to 2,770,483 tons during the week ended Sept. 3 from 3,008,179 tons the preceding week. This was due to stormy weather on Lakes Superior and Huron. The cumulative total for the season to 7 a.m., Sept. 3, is 59,851,788 tons compared with 47,789,281 for the like period a year ago, a gain of 12,062,507 tons.

The three 647-foot iron ore carriers being built for Pittsburgh Steamship Co. will be named the *Philip R. Clarke*, *Arthur M. Anderson*, and *Cason J. Callaway*. Scheduled for launching toward the end of 1951, the vessels will add 2.2 million tons a year to the iron ore carrying capacity of this United States Steel subsidiary's 61-vessel fleet.

The 666-foot self-unloading limestone carrier, being built for Bradley Transportation Co., will be named *John G. Munson*. It will have a carrying capacity of 20,000 gross tons of stone.

Scrap . . .

Scrap Prices, Page 164

New York—Scrap brokers are under heavy pressure for the steel grades, but report demand for cast scrap is not too active. Some iron foundries have moderate stocks. Moreover, they report business as spotty. Collections of cast grades are a little freer.

Philadelphia—District consumers of open-hearth scrap have not been able to build up inventories to any extent, if at all. At the same time they have not had to curtail production because of lack of scrap.

Pittsburgh—Allocations account for almost the entire scrap movement here. Dearth of scrap creates alarm in operating circles as increased defense demands are expected over the winter. Main hope is that the mission in Korea will be able to turn up quantities of battlefield scrap. Expected yield from Korea is 300,000 tons while India it is hoped will offer about 250,000 tons. Pacific islands will be visited in the quest for scrap.

Buffalo—Efforts to build reserve scrap stocks were jolted severely last week as dealers throughout the area were shipping to two Ohio distress

points under government allocation.

Detroit—Members of this area's scrap mobilization committee met last Thursday to evaluate progress of the drive and discuss future action. Traders believe scrap collection must be stepped up to prevent a famine while Detroit plants are in the transition period. Meanwhile, mills have been able to maintain operations at high levels, having more and more help through directed scrap receipts.

Cleveland—Representatives of National Production Authority from Washington were investigating the scrap situation in Ohio last week. Spot checks were made at dealers' yards as well as mills to determine the actual supply as compared to requirements. Movement of industrial scrap is slower, but trade interests expect a gradual gain in momentum as the season advances. Some foundries are in dire need of scrap, although the overall situation in this industry has improved slightly.

Cincinnati—Temporary relief of the dire scrap shortage of Armco at Middletown was gained through allocations. The question of a steady flow in volume to support capacity melt remains unsolved, and is especially grave in looking forward to winter.

Chicago—Shipment of "super-allocation" scrap of steelmaking grades to Armco Steel Corp.'s Middletown, O., works is leaving practically no "free" scrap in the Chicago district. Demand for open-hearth and electric furnace grades far exceeds supply. Blast furnace grades also find a ready market. Calls for cast grades have eased somewhat, due to slackening in foundry activity.

Seattle—Competition for available supplies of steel scrap is intense. Receipts cover consumption but inventories are not being replenished. Buyers believe the government should assist in scrap collection in remote areas where costs and shipping charges are high. Alaska railroad has called tenders for 5000 tons and the Puget Sound Navy yard is moving its scrap quickly. Buyers state there is considerable tonnage remaining in the Aleutians but costs of bringing it to furnace are prohibitive under present price ceilings.

Chrome Ore . . .

Washington—Chrome ore and concentrates have been added to the government's long-range purchasing program designed to encourage development and production of critical metals. Depot has been established at Grants Pass, Oreg., to which miners and producers may ship chrome for inspection and purchase.

General Services Administration's program calls for purchase of up to 200,000 tons of specification chrome ore concentrates of domestic origin by June 30, 1955. Under the regulation, five tons of ore will be the minimum shipment accepted and no more than 2000 tons a year will be accepted from any one source without prior written approval of the government.

Prices paid will depend on the chromic oxide content of the ore as well as the ratio of chromium to iron. The base price for lumpy ore is \$115 per ton and for fines and concentrates \$110.

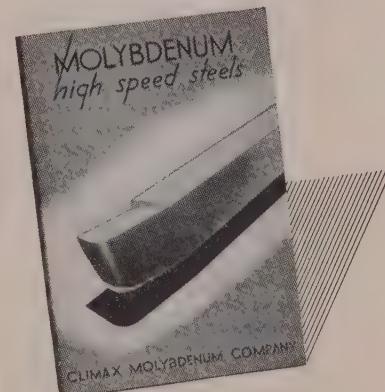
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Warehouse . . .

Warehouse Prices, Page 163

Cleveland—Steel distributors anticipate increasing stringency in supplies of the major products over remaining months of the year. Drying up of the area of "free" supplies cuts off a source of substantial tonnage for the warehouses. Their receipts from the mills, scheduled over last quarter at 85 per cent of their base period tonnage, are expected to fall short of demands by a wide margin in most items. Increase in warehouse receipts of carbon steel products to 100 per cent of the base period tonnage is not likely to go into effect before first quarter. This is a keen disappointment to distributors since the increase was originally scheduled to become effective with fourth quarter. Some foreign steel continues to be received at Great Lakes ports and this tonnage is helping relieve the shortage to some extent.

Philadelphia—A slight falling off in business this month due to the Labor Day holiday and the fact that September is a shorter month is expected by warehousemen.

Chicago—Shifting of demand at warehouses is noted. From some types of consumers demand is softer, while from others it is stronger. Net effect is that overall warehouse volume is as heavy as ever. Distributors could sell three times as much steel as they are allotted under government regulations.

San Francisco—Slight softening in demand for specialty steels is noted. Otherwise business continues brisk.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 161

Pittsburgh—Most foundries and steel plants have sufficient inventories of oven coke and the market is quiet and slow. Beehive foundry shipments to other consuming areas make up the major part of movement in that grade.

Chicago—Metallurgical coke which has been in easy supply, is in slightly less demand, largely because of production cutbacks by some foundries. Coke deliveries can be had immediately. Quality is good.

Canada . . .

Hamilton, Ont.—New blast furnace of the Dominion Foundries & Steel Ltd. here has been blown in. The company is the fourth steel producer in Canada to make its own pig iron.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

6000 tons, including plates, axles, etc., refrigerator cars, to Pacific Car & Foundry Co., Penton, Wash., to various producers. 1750 tons, state highway bridge, Union county, New Jersey, through Franklin Construction Co., Newark, N. J., general contractor, to Harris Structural Steel Co., New York. 925 tons, state bridgework, Cumberland and York counties, Pennsylvania, to Bethlehem Steel Co. 100 tons, Hartford Park housing project, Providence, R. I., to Providence Iron & Steel Co., Providence; E. Turgeon Construction Co. Inc., Providence, general contractor. Unstated, government-furnished, 133-foot steel span for Alaska Railroad; general contract to Munter Construction Co., Seattle.

STRUCTURAL STEEL PENDING

2800 tons, hangar, Boeing Airplane Co., Seattle; plans in preparation. 2780 tons, Russell Street viaduct, Municipal Department of Public Works, Baltimore, bids Sept. 13; also 500 tons reinforcing steel, 8700 linear feet of steel H piles, and 18,700 linear feet of pipe piling. 1080 tons, junior high school, Bronx, New York; Colmar Construction Co., Brooklyn, low on general contract. 400 tons, jig erection building for Boeing Airplane Co., Seattle; general contract to Austin Co., Seattle. 150 tons, station alterations, Pennsylvania Railroad, Camden, N. J.; bids to be closed shortly. 150 tons, artillery and fire control building, Army, Aberdeen, Md.; bids Sept. 11.

REINFORCING BARS . . .

REINFORCING BARS PLACED

2500 tons, Hartford Park housing project, Providence, R. I., to Plantations Steel Co., Providence; E. Turgeon Construction Co. Inc., Providence, general contractor. 2000 tons, forge-press building, Wyman-Gordon Co., North Grafton, Mass., to United States Steel Supply Co., Cambridge, Mass.; Gilbane Construction Co., Providence, R. I., general contractor. 1235 tons, outside utilities, Eielson air base, Alaska, to Bethlehem Pacific Coast Steel Corp., Seattle; Lytle-Green, S. Birch & Son, and J. C. Boespfug Construction Co., joint low on general contract, \$3,492,460. 725 tons, substructure, bridge, Merrimac river, Amesbury-Newburyport, Mass., to Bethlehem Steel Co.; Merritt-Chapman-Scott Corp., Boston, general contractor. 500 tons, warehouse, Western Electric Co., Seattle, to Northwest Steel Rolling Mills Inc., Seattle; general contract to J. C. Boespfug Construction Co., Seattle. 170 tons, Rock Island dam and Columbia Basin project, to Bethlehem Pacific Coast Steel Corp., Seattle. 160 tons, apartment building, Fairbanks, Alaska, to Inland Empire Steel Co., Seattle; S. S. Mullen, Seattle, general contractor.

REINFORCING BARS PENDING

150 tons, laterals Potholes canal, Columbia Basin project; bids, four schedules, to Bureau of Reclamation, Ephrata, Wash., Sept. 19. Unstated, approaches White Salmon bridge, Columbia river; Natt McDougall Co., Portland, Ore., low \$83,905, to Port of Hood River, Oregon.

PLATES . . .

PLATES PENDING

Unstated, two tank farms and plant tanks, vanillin plant, Seattle, for Monsanto Chemical Co., Seattle; preliminary construction contract awarded E. F. Schuck Co., Seattle.

PIPE . . .

STEEL PIPE PENDING

Unstated, 2745 feet, 18 and 16 inch, system improvements; bids to Roy B. Hartmaker, city clerk, Leavenworth, Wash., Sept. 10.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Atlanta & St. Andrews Bay, two 1500-hp diesel-electric locomotive units, to Electro-Motive Division, General Motors Corp., La Grange, Ill. Toledo, Peoria & Western, two 1500-hp, diesel-electric road-switcher units, to Electro-Motive Division, General Motors Corp., La Grange, Ill.

LOCOMOTIVES PENDING

Long Island Railroad, 12 diesel locomotives; trustee seeking court permission for purchase; also permission for purchase of 20 passenger cars.

RAILROAD CARS PLACED

Western Fruit Express, 300 refrigerator cars, to Pacific Car & Foundry Co., Seattle. Burlington, 100 refrigerator cars, to Pacific Car & Foundry Co., Penton, Wash.

ATLANTA, Georgia

Morrison-Drabner Steel Co., Inc., 82-84 Milton Ave., Alpine 4885

BALTIMORE, Maryland

Hill-Chase Steel Company of Maryland 6311 Erdman Ave., Peabody 7300

Asheboro, N.C.

Phone 8849

Richmond, Va.

Phone 7-4573

BEAUMONT, Texas

Standard Brass & Mfg. Co., 705 Milam St., Phone 4-2641

CHICAGO, Metropolitan Area

Korhummel, Heffron & Preiss Steel Co., 2424 Octagon St., Evanston, Ill.; Ambassador 2-6700

CINCINNATI, Ohio

Morrison-Drabner Steel Co., Inc., 1017-1084 Summer St., Wabash 4480, 4481

CLEVELAND, Ohio

Nottingham Steel Company W. 45th St. & Division Ave., Atlantic 5100

DALLAS, Texas

Delta Metals, Division of Delta Distributors, Inc., 3201 Oak Lane, Hunter 7446

DAVENPORT, Iowa

Nichols Wire & Aluminum Co., 1725 Rockingham Rd., Phone 3-1895

DETROIT, Michigan

Cauhorn Distributing Company 9999 Broadstreet, Texas 4-7000

Copper & Brass Sales, Inc., 3000 E. Woodbridge, Lorain 7-3380

HONOLULU, T. H.

Permanente Cement Co., Pier 32, P. O. Box 79, Phone 5-2541

HOUSTON, Texas

Standard Brass & Mfg. Co., 2020 Franklin Ave., Preston 1123

INDIANAPOLIS, Indiana

F. H. Langenkamp Company 229 E. South St., Riley 9311

KANSAS CITY, Missouri

Industrial Metals, Inc., 410 Southwest Blvd., Victor 1041

LOS ANGELES, California

Eureka Metal Supply Company 551 E. Macy St., Mutual 7286

Earle M. Jorgenson Company 10650 S. Alameda, Lucas 0281

Reliance Steel Company 2068 E. 37th St., Adams 6133

MILWAUKEE, Wisconsin

KHP Milwaukee Steel Company 4600 W. Mitchell St., Evergreen 4-6000

MINNEAPOLIS, Minnesota

Korhummel, Heffron & Preiss Steel Co., 3225 S.E. Como Avenue

Gladstone 4943, Prior 4030

NEW ORLEANS, Louisiana

Orleans Steel Products Co., Inc., 1019-1025 Bienville St., Raymond 2116

Standard Brass & Mfg. Co., 2309 Tulane Ave., Aud. 1353

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A. R. Purdy Co., Inc., Page Ave. & Orient Way, Lyndhurst, N. J.

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New York: Chelsea 3-4455

Newark: Humboldt 2-5566

OAKLAND, California

Gilmore Steel & Supply Company 1960 Cypress, Glencourt 1-1680

OMAHA, Nebraska

Gate City Steel Works 11th & Seward Sts., Atlantic 1830

ORLANDO, Florida

Profile Supply Company P. O. Box 2049, 1601 Atlantic Ave., Phone 7124

PHILADELPHIA, Pennsylvania

Hill-Chase & Company, Inc., Trenton Ave. & Ontario, Delaware 6-5400

Allentown: Allentown 28077

York: York 5790

PHOENIX, Arizona

Arizona Hardware Co., Inc., First & Jackson Sts., Phone 8-5331

PORT ARTHUR, Texas

Standard Brass & Mfg. Co., KCS & Fourth St., Phone 5-9377

PORTLAND, Oregon

Eagle Metals Company 2336 N. Randolph, Tuxedo 5201

SAN FRANCISCO, California

Gilmore Steel & Supply Company 840 Brannan St., Klondike 2-0511

SEATTLE, Washington

Eagle Metals Company 4755 First Ave. S., Lander 9974

SHREVEPORT, Louisiana

Standard Brass & Mfg. Co., 1557 Texas Ave., Phone 2-9483

SPOKANE, Washington

Eagle Metals Company E. 320 Trent Ave., Madison 2419

WICHITA, Kansas

General Metals Mfg. Co., Inc., 218-220 S. Wichita, Phone 7-1208, 7-1209

Metalworking Briefs . . .

CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

Budd Orders Heat Treat Line

Contract for the construction of a complete heat treat line for the production of rocket heads was awarded to Loftus Engineering Corp., Pittsburgh, by Budd Co., Philadelphia. The new line will heat treat 150 units an hour.

Clearing Machine Buys Plant

Clearing Machine Corp., press manufacturer, Chicago, purchased a plant in Hamilton, O., from Liberty Planers Inc., division of Hamilton-Thomast Corp., that city. The new plant will take the place of one Clearing had proposed to build in Joliet, Ill.

Barnes-Shasta Pump Co.

Shasta Pump Co., Oakland, Calif., merged with Barnes Mfg. Co., Mansfield, O. The new firm, Barnes-Shasta Pump Co., will be directed by J. E. Piccardo, the operating vice president.

Ingersoll-Rand Moves Branch

Ingersoll-Rand Co., New York, moved its Cleveland office to 4506 Chester Ave. More adequate office and warehouse facilities are provided at the new location.

Aetna-Standard Moves Office

Executive and sales offices of Aetna-Standard Engineering Co. are now located in the Frick Bldg., Pittsburgh. Engineering, accounting and purchasing offices are located in the company's new office building located in Ellwood City, Pa.

Boosts Annealing Capacity

Calstrip Steel Corp., Los Angeles, producer of cold-rolled strip, completed a building to house five annealing furnaces which increases the firm's annealing capacity by 42 per cent.

Delco Expands in Rochester

General Motors Corp., Detroit, plans an initial expenditure of \$2,310,000 on expansion of its Delco Appliance Division, Rochester, N. Y.

Bell Aircraft Boosts Output

Bell Aircraft Corp., Buffalo, is preparing for production of guided missiles on a large scale in its Niagara Falls, N. Y., plant. Present facilities for the manufacture of jet-engine nacelles will be moved to the firm's Buffalo plant, making space available for the guided missiles program.

Bell also is expanding its facilities for the manufacture of precision gears for its products.

De Laval Expands on Coast

De Laval Steam Turbine Co., Trenton, N. J., completed a building at 160 Folsom St., San Francisco, and will establish its San Francisco headquarters for sales and service in the structure. It will provide increased warehousing facilities for pumps, speed reducers and flexible couplings. C. F. Reeves is in charge of De Laval's West Coast sales.

Alofs Mfg. Co. Moves

Alofs Mfg. Co.—pressed steel goods, dies, stampings and contract manufacturing—moved its offices and factory to 345 32nd St. S.W., Grand Rapids 8, Mich.

Neomatic Doubles Capacity

Neomatic Inc., Los Angeles, doubled its capacity for production of subminiature relays by moving to a larger plant at 11632 San Vicente Blvd.

Ceramic Coated Exhausts

Ryan Aeronautical Co., San Diego, Calif., announced the nation's first volume production contracts for adaptation of an ancient art to modern aircraft—ceramic coating of exhaust systems to conserve increasingly scarce strategic alloys.

Plans \$7 Million Plant

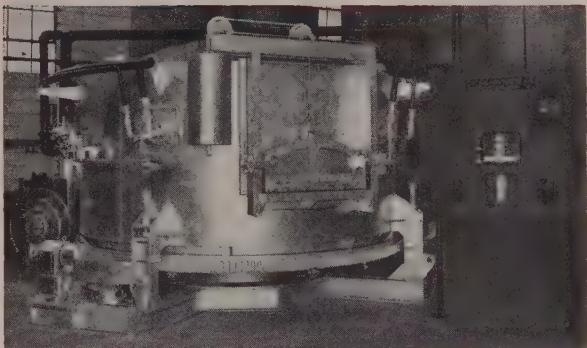
Davison Chemical Corp., Baltimore, will erect a \$7 million catalyst plant six miles south of Lake Charles, La. Present schedule calls for operation of the plant early in 1953.

Erects Plant in Canada

Canadian Westinghouse Co. Ltd., Toronto, Ont., is erecting a plant in Hamilton, Ont., which will provide employment for about 1000 workers when it is completed in 1952.

Schedules Plant Opening

Formal opening in October has been scheduled by National Radiator Co., Johnstown, Pa., of its \$1,250,000 plant at Duncansville, Pa. Production of boiler jackets, convectors and convector enclosures, baseboard radiation, and other sheet metal items may be started prior to the dedication and opening ceremonies, says Robert S. Waters, president. Nearly \$400,000 worth of new machinery and equipment is



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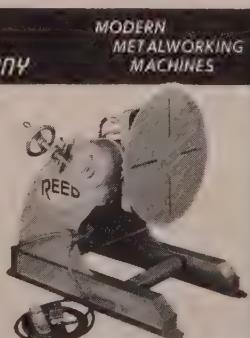
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WRITE FOR BULLETIN 79



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being installed, in addition to a variety of presses, shears, press brakes, grinders, welding units and miscellaneous equipment which will be moved from other National Radiator plants.

Fruehauf Builds in Brazil

A new company to assemble and manufacture in Brazil all kinds of trailers and trailer bodies was organized by Roy Fruehauf, president, Fruehauf Trailer Co., Detroit. The organization, Fruehauf Trailer S.A., Industria e Comercio, will have headquarters in Sao Paulo, Brazil. Dr. Ary F. Torres is director-president of the new organization, while L. C. Burnett is managing director.

Buy's Kitchen Cabinet Firm

American Radiator & Standard Sanitary Corp., Pittsburgh, purchased Acme Metal Products Corp., Blue Island, Ill. Acme, producer of kitchen cabinets in that city and in Dover, N. J., will be operated as a wholly-owned subsidiary and will retain its present name.

Kone Engineering Co. Moves

Kone Engineering Co., repairer of boiler plant instruments, moved into larger quarters at 5615 York Rd., Govans, Baltimore.

Quirino Buys Pipe Plant

California Pipe & Fitting Co., Taft, Calif., was sold to Antonio Quirino, brother of President Elpidio Quirino of the Philippines. The price was reportedly in excess of \$100,000. The plant's molds, blast furnace and other equipment will be shipped to the Philippines.

Metals Disintegrating Co.

Metals Disintegrating Co., Inc., Elizabeth, N. J., manufacturer of metal pigments, metal powders and metal abrasives, appointed Roy A. Ribelin Distributing Co., Houston, as distributor for aluminum pastes and powders and gold bronze powders in southeastern Texas.

Utility Firm Plans Expansion

Consolidated Gas Electric Light & Power Co., Baltimore, plans to acquire a tract of 108 acres in Anne Arundel county as a site for a new generating plant. Plans call for the erection of an initial unit of 100,000 to 125,000 kilowatt capacity.

Linde To Build Ohio Plant

Plans are being completed by Linde Air Products Co., a division of Union Carbide & Carbon Corp., New York, for a liquid oxygen and argon plant to be constructed at Ashtabula, O. Gases pro-

duced in the plant will be used principally by the steel and metalworking industries of the Ashtabula and adjacent areas. The plant will be built on the property of Electro Metallurgical Co., another division of Union Carbide, on Lake East road. Orders for equipment for the new plant have been placed. Operations are scheduled to begin in mid-1952.

Koppers Expands on Coast

Koppers Co. Inc., Pittsburgh, expects to place its first West Coast plant in operation around the middle of October. The \$1 million plant is south of Fontana, Calif., about two miles from Kaiser Steel Corp.'s steelworks. A major expansion is planned for Koppers' Fontana plant after its initial operations get underway. S. J. Katz is the Pacific Coast district manager.

Thompson-Muskegon Merger

Muskegon Piston Ring Co., Muskegon, Mich., and Thompson Products Co., Cleveland, have agreed to merge, subject to approval of Muskegon stockholders. The Muskegon firm makes piston rings in that city for sale to manufacturers of internal combustion engines of all types. The company also has two foundries at Sparta, Mich., for the production of large quantities of piston ring castings. These foundries will assure Thompson and its wholly-owned subsidiary, Ramsey Corp., St. Louis, of an adequate supply of castings to meet requirements for rings sold in the export and jobber replacement markets, fields in which Muskegon does not participate. Present management of Muskegon would continue to direct the company, says Frederick C. Crawford, president of Thompson Products Co.

Opens Chicago Warehouse

General Refractories Co., Philadelphia, opened its newly-constructed warehouse at 4242 W. 45th St., Chicago. Manager of the new property is Roger W. Braden, having been transferred from New York where he had been manager of the company's warehouse in that city.

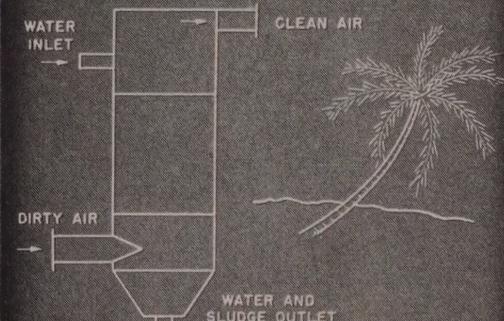
Tubesupply Formed on Coast

James A. Baxter, John De Young and Robert Brinkley organized Tubesupply, establishing offices at 1048 Sixth Ave. S., Seattle, to distribute tubing items representing Tube Sales, Los Angeles. Mr. Baxter had been assistant sales manager and Mr. De Young assistant purchasing agent for Seattle Steel Co., both resigning to

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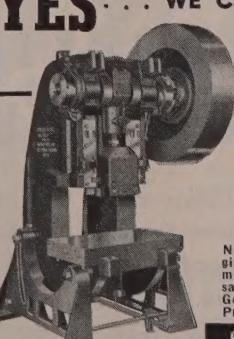
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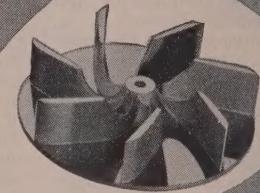
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oin Mr. Brinkley who previously represented Tube Sales. They plan active expansion of the tubing business.

Rand Plans Research Center

Rand Corp., Santa Monica, Calif., will construct a \$2 million building for endowed scientific and development research in that city. Rand Corp. is successor to Rand Project, top-secret research and development agency operated by Douglas Aircraft Co. Inc. in World War II.

Dynamatic Builds Laboratory

Dynamatic Corp., subsidiary of Eaton Mfg. Co., Cleveland, is building a research and development laboratory in Kenosha, Wis. The building, estimated to cost in excess of \$100,000, will have an equipped value of \$500,000.

Little-Beaver Co. Moves

Little-Beaver Co., Baltimore, manufacturer of aluminum storm doors and windows and fabricator of other products, moved into larger quarters at 1507 Ashland Ave.

Chain Belt Builds Warehouse

Chain Belt Co., Milwaukee, is constructing a warehouse in Portland, Oreg. Besides housing increased stocks of chain, sprockets, power transmission equipment, take-ups, elevator buckets, belt conveyor idlers, and spray nozzles, the new building also will contain the company's Portland district sales office.

Worthington Opens Branch

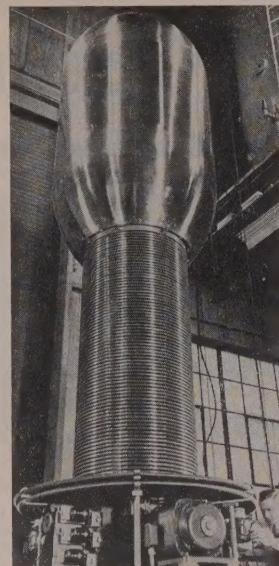
Worthington Pump & Machinery Corp., Harrison N. J., opened a branch office in Harrisburg, Pa., at Second and Locust streets. The office will be in charge of A. L. Mays and will be a branch of Worthington's Philadelphia office.

Moves Oakland Warehouse

Oakland Division, Ziegler Steel Service Co., Los Angeles, moved into a new building at 727 Sixty-sixth Ave., Oakland, Calif. In operation for two years, Ziegler's San Francisco-Oakland warehouse stocks sheet, strip and bar steel in hot-rolled, hot-rolled pickled and cold-finished grades.

Dresser Equipment Co. Sold

Keystone Driller Co., Beaver Falls, Pa., purchased the cable tool drilling machinery business of Dresser Equipment Co., Columbus, O. Dresser Equipment is being moved to the Beaver Falls plant of Keystone,



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says Harold J. Ruttenberg, president of Keystone.

Norton To Boost Production

Increased facilities for manufacture of silicon carbide grain are planned by Norton Co., Worcester, Mass. Two of the present abrasive mills in that city will be re-equipped by the company. By combining the crushing and milling units now housed in these two mills, Norton's processing of silicon carbide grain will be increased 30 per cent.

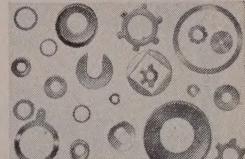
Weatherhead Names Agents

Weatherhead Co., Cleveland, manufacturer of tubing and pipe fittings, appointed the following distributors who will carry stocks of various Weatherhead products: B. H. Deacon Co. Inc., Philadelphia; Knox Inc., East Walpole, Mass.; Spence Tool & Rubber Co., Peoria, Ill.; P. T. Standard Parts Co., Pontiac, Mich.; Diesel Injection Sales & Service, Norfolk, Va.; Harry Cornelius Co., Albuquerque, N. M.; Hardware & Supply Co., Akron and Massillon, O.; Hydro Pneumatics Inc., New York; Robins Rubber Division, A. K. Robins & Co. Inc., Baltimore.



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